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Access DB# 103546

## SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: HELEN PIZZUTO Examiner #: 70058 Date: 8/27/03  
Art Unit: 1713 Phone Number 301-2393 Serial Number: 09/980,387  
Mail Box and Bldg/Room Location: CP-8B16 Results Format Preferred (circle) PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*  
Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc. if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: SEE ATTACHED

Inventors (please provide full names):  
↓

Earliest Priority Filing Date: 6/4/99

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

A halogenated (F, Cl, Br) xanthate as broadly defined in claim 17 -> (1A), (1B) or (1C) with R<sup>2</sup> & R<sup>1</sup> further defined in claims 21-23 and most narrowly defined species in claim 25

KEY WORDS

CONTROLLED/LIVING FREE RADICAL POLYMERIZATION  
CHAIN TRANSFER AGENT LIVING POLYMERIZATION

PLEASE ATTACH PAGES SUBMITTED HEREIN WITH SEARCH REPORT  
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Online Time: 35 Patent Family \_\_\_\_\_ WWW/Internet \_\_\_\_\_  
Other \_\_\_\_\_ Other (specify) \_\_\_\_\_

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DICTIONARY FILE UPDATES: 28 AUG 2003 HIGHEST RN 575429-31-1

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Experimental and calculated property data are now available. See HELP  
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in the CAS Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

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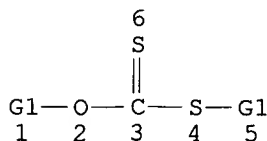
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FILE COVERS 1907 - 29 Aug 2003 VOL 139 ISS 10  
FILE LAST UPDATED: 28 Aug 2003 (20030828/ED)

This file contains CAS Registry Numbers for easy and accurate  
substance identification.

=> D QUE L19

L5 STR



VAR G1=AK/CY

7, 150 structures from  
the query

## NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

## GRAPH ATTRIBUTES:

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NUMBER OF NODES IS 6

## STEREO ATTRIBUTES: NONE

L7 7150 SEA FILE=REGISTRY SSS FUL L5  
 L8 3267 SEA FILE=HCAPLUS ABB=ON L7  
 L10 28 SEA FILE=HCAPLUS ABB=ON L8 (L) CHAIN (L) TRANSFER?  
 L11 293987 SEA FILE=HCAPLUS ABB=ON POLYMERIZATION/IT  
 L12 4361 SEA FILE=HCAPLUS ABB=ON L11 (L) LIVING  
 L13 8 SEA FILE=HCAPLUS ABB=ON L8 AND L12  
 L14 20560 SEA FILE=HCAPLUS ABB=ON L11 (L) RADICAL  
 L15 31 SEA FILE=HCAPLUS ABB=ON L8 AND L14  
 L16 9457 SEA FILE=HCAPLUS ABB=ON CHAIN (L) TRANSFER (L) POLYMERI?  
 L17 38 SEA FILE=HCAPLUS ABB=ON L16 AND L8  
 L18 52 SEA FILE=HCAPLUS ABB=ON L10 OR L13 OR L15 OR L17  
 L19 46 SEA FILE=HCAPLUS ABB=ON L18 AND POLYMER?/SC, SX

=&gt; D L19 ALL 1-46 HITSTR

*46 CA references with utility*

L19 ANSWER 1 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:492750 HCAPLUS  
 DN 139:69656  
 TI S-(.alpha.,.alpha.'-disubstituted-.alpha.'-acetic acid) substituted  
 dithiocarbamate derivatives for controlled radical polymerizations,  
 process and polymers made therefrom  
 IN Lai, John Ta-yuan  
 PA USA  
 SO U.S. Pat. Appl. Publ., 34 pp., Cont.-in-part of U.S. Ser. No. 505,749.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM C07C333-18  
 NCL 558232000  
 CC 35-2 (Chemistry of Synthetic High **Polymers**)  
 FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003120101	A1	20030626	US 2002-278335	20021023
	US 6596899	B1	20030722	US 2000-505749	20000216
PRAI	US 2000-505749	A2	20000216		

OS MARPAT 139:69656

AB Dithiocarbamate derivs. are disclosed, along with a process for prepg. the  
 same. The dithiocarbamate compds. can be utilized as initiators,  
**chain transfer** agents and/or terminators in controlled  
 free radical **polymn.** (e.g., of styrene). The dithiocarbamates  
 can be used to produce polymers having narrow mol. wt. distribution.  
 Advantageously, the compds. of the present invention can also introduce  
 functional groups into the resulting polymers. The dithiocarbamate  
 compds. have low odor and are substantially colorless.  
 HO2CCMe2SC(:S)SCMe2CO2H was prepd. from CS2, CHCl3, acetone, and BuNHSO4.  
 ST thiocarbamate initiator **chain transfer** agent  
 controlled radical **polymn**

## IT Chain transfer agents

**Polymerization catalysts**

(S-(.alpha.,.alpha.'-disubstituted-.alpha.'-acetic acid) substituted dithiocarbamate derivs. for controlled **radical** polymns., process and polymers made therefrom)

## IT Chain transfer agents

**Polymerization catalysts**

(inifers; S-(.alpha.,.alpha.'-disubstituted-.alpha.'-acetic acid) substituted dithiocarbamate derivs. for controlled **radical** polymns., process and polymers made therefrom)

IT 20940-21-0P **52831-98-8P 133944-74-8P** 355120-40-0P

381715-14-6P 461642-78-4P 488129-64-2P 548761-45-1P 548761-46-2P

548761-47-3P 548761-48-4P 548761-49-5P 548761-50-8P 548761-51-9P

548761-52-0P 548761-53-1P 548761-54-2P 548761-55-3P 548761-56-4P

548761-57-5P 548761-58-6P

RL: CAT (Catalyst use); IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(S-(.alpha.,.alpha.'-disubstituted-.alpha.'-acetic acid) substituted dithiocarbamate derivs. for controlled radical polymns., process and polymers made therefrom)

IT 9003-20-7P, Vinyl acetate homopolymer 9003-49-0P, n-Butylacrylate homopolymer 9003-53-6P, Polystyrene 9003-77-4P, 2-Ethylhexylacrylate homopolymer 25267-41-8P 119708-91-7P, 2-Ethylhexylacrylate-styrene block copolymer

RL: IMF (Industrial manufacture); PREP (Preparation)

(S-(.alpha.,.alpha.'-disubstituted-.alpha.'-acetic acid) substituted dithiocarbamate derivs. for controlled radical polymns., process and polymers made therefrom)

IT 67-64-1, Acetone, reactions 67-66-3, Chloroform, reactions 75-15-0, Carbon disulfide, reactions 107-87-9, 2-Pentanone 108-10-1, Methyl isobutyl ketone 108-94-1, Cyclohexanone, reactions 109-89-7, Diethylamine, reactions 111-49-9 112-55-0, Dodecylmercaptan 124-02-7, Diallylamine 124-40-3, Dimethyl-amine, reactions 128-04-1, Sodium dimethyldithiocarbamate 136-30-1, Sodium N,N-dibutyldithiocarbamate 140-89-6 148-18-5, Sodium N,N-diethyl dithiocarbamate 873-58-5, Sodium morpholinodithiocarbamate 877-78-1 2219-18-3 2801-05-0, Sodium N,N-diphenyldithiocarbamate 24678-65-7 109761-63-9 548761-59-7

RL: RCT (Reactant); RACT (Reactant or reagent)

(S-(.alpha.,.alpha.'-disubstituted-.alpha.'-acetic acid) substituted dithiocarbamate derivs. for controlled radical polymns., process and polymers made therefrom)

IT **52831-98-8P 133944-74-8P**

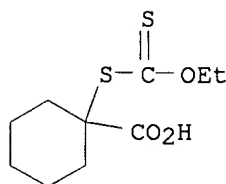
RL: CAT (Catalyst use); IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)

(S-(.alpha.,.alpha.'-disubstituted-.alpha.'-acetic acid) substituted dithiocarbamate derivs. for controlled radical polymns., process and polymers made therefrom)

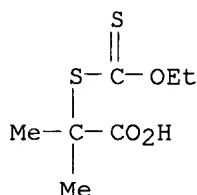
RN 52831-98-8 HCAPLUS

CN Cyclohexanecarboxylic acid, 1-[(ethoxythioxomethyl)thio]- (9CI) (CA INDEX NAME)





RN 133944-74-8 HCAPLUS  
 CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-2-methyl- (9CI) (CA INDEX NAME)



L19 ANSWER 2 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:382298 HCAPLUS  
 DN 139:101459  
 TI A Kinetic Investigation of Seeded Emulsion **Polymerization** of Styrene Using Reversible Addition-Fragmentation **Chain Transfer** (RAFT) Agents with a Low **Transfer** Constant  
 AU Smulders, Wilfred; Gilbert, Robert G.; Monteiro, Michael J.  
 CS Polymer Chemistry Coatings Technology, Eindhoven University of Technology, Eindhoven, 5600, Neth.  
 SO Macromolecules (2003), 36(12), 4309-4318  
 CODEN: MAMOBX; ISSN: 0024-9297  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB The mechanisms were investigated for the seeded emulsion **polymn.** of styrene mediated by xanthate-based reversible addn.-fragmentation **chain transfer** (RAFT) agents with low **transfer** consts. (ca. 0.7). .gamma.-Radiolysis relaxation measurements were used to det. the exit rate coeff. directly; this increased with the amt. of RAFT, consistent with the **chain-transfer** characteristics of RAFT and the std. **transfer**/diffusion mechanism for exit. Combining the exit data with measurements of the steady-state rate with chem. initiation showed that the entry rate coeffs. decreased with the amt. of RAFT, while with .gamma. initiation the entry rate coeffs. were unaffected, unless a very high RAFT concn. was used. This behavior is inconsistent with conventional assumptions about RAFT and the aq.-phase propagation model for entry (which predicts the entry rate coeff. successfully for ordinary emulsion **polymn.** systems). It is postulated that the RAFT agents used in this work are surface active, which is not unexpected given the canonical forms of these RAFT agents. The dramatic decrease in entry rate coeff. for the chem. initiated system can be taken into account within the framework of the std. aq.-phase model

for entry if it is assumed that the surface activity gives an increased concn. of RAFT near the surface, which leads to increased **transfer** to radicals which desorb instead of entering, and whose subsequent reentry is "frustrated" by this event recurring, until they eventually undergo aq.-phase termination.

ST styrene emulsion **polymn** kinetics addn fragmentation  
**chain transfer**

IT **Polymerization** kinetics  
(emulsion; kinetics of seeded emulsion **polymn.** of styrene using reversible addn.-fragmentation **chain transfer** agents)

IT **Chain transfer**  
**Chain transfer** agents  
(kinetics of seeded emulsion **polymn.** of styrene using reversible addn.-fragmentation **chain transfer** agents)

IT **73232-07-2P 123972-86-1P**  
RL: NUU (Other use, unclassified); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(**chain transfer** agent; kinetics of seeded emulsion **polymn.** of styrene using reversible addn.-fragmentation **chain transfer** agents)

IT 100-42-5, Styrene, reactions 140-89-6 535-11-5, Ethyl 2-bromopropionate 585-71-7, 1-Bromoethylbenzene  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(kinetics of seeded emulsion **polymn.** of styrene using reversible addn.-fragmentation **chain transfer** agents)

IT 9011-14-7, PMMA  
RL: NUU (Other use, unclassified); USES (Uses)  
(seed latex; kinetics of seeded emulsion **polymn.** of styrene using reversible addn.-fragmentation **chain transfer** agents)

RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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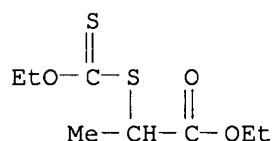
IT 73232-07-2P 123972-86-1P

RL: NUU (Other use, unclassified); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(chain transfer agent; kinetics of seeded emulsion  
 polymn. of styrene using reversible addn.-fragmentation  
 chain transfer agents)

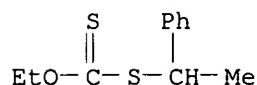
RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



L19 ANSWER 3 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2003:295464 HCAPLUS

DN 139:52514

TI Silylated Cyclohexadienes as New Radical Chain Reducing Reagents: Preparative and Mechanistic Aspects

AU Studer, Armido; Amrein, Stephan; Schleth, Florian; Schulte, Tobias; Walton, John C.

CS Fachbereich Chemie, Universitaet Marburg, Marburg, D-35032, Germany

SO Journal of the American Chemical Society (2003), 125(19), 5726-5733

CODEN: JACSAT; ISSN: 0002-7863

PB American Chemical Society

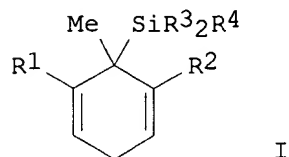
DT Journal

LA English

CC 21-2 (General Organic Chemistry)

Section cross-reference(s): 22, 35, 77

GI



AB Various silylated 1,4-cyclohexadienes, e.g. I (R1, R2 = H, MeO; R3 = R4 = Me, Me2CH; R3 = Me, R4 = Me3C) and their benzo- and dibenzo-fused analogs, are presented as superior tin hydride substitutes for the conduction of various radical chain redns. Debrominations, deiodinations, and deselenations, Barton-McCombie-type deoxygenations, radical cyclizations, ring expansions, and Giëse-type addn. reactions can be performed using these environmentally benign reagents. I (R1 = R2 = MeO; R3 = Me; R4 = Me3C) was also used as a regulator for polymn. of styrene. Rate consts. for hydrogen atom abstraction from two 1-silyl-cyclohexadienes by primary C-radicals were detd., and the effects of the cyclohexadiene substituents on the reaction outcomes were discussed. Finally, qual. EPR expts. on silyl radical expulsion from silylated cyclohexadienyl radicals were carried out.

ST cyclohexadiene silylated radical **chain** reducing reagent; haloalkane dehalogenation silylated cyclohexadiene; selenide deselenation silylated cyclohexadiene; haloarene dehalogenation silylated cyclohexadiene; xanthate reductive cleavage silylated cyclohexadiene; thionocarbonate reductive cleavage silylated cyclohexadiene; cyclization radical silylated cyclohexadiene; styrene **polymn** radical silylated cyclohexadiene; ring expansion radical silylated cyclohexadiene; Giëse addn silylated cyclohexadiene; hydrogen **transfer** kinetics silylated cyclohexadiene; Barton McCombie deoxygenation silylated cyclohexadiene; radical expulsion silylated cyclohexadiene EPR spectroscopy

IT Addition reaction  
Deoxidation

(homolytic; reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)

IT Cycloalkadienes

RL: RGT (Reagent); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(non-conjugated; reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)

IT Cyclization

(radical; reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as

- radical chain reducing reagents)
- IT **Polymerization**  
(**radical**; styrene **polymn.** using silylated cyclohexadienes as **radical** chain reducing reagents)
- IT Ring enlargement  
(reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)
- IT Dehalogenation  
(reductive; reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)
- IT Substitution reaction  
(retroselenylation, homolytic; reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)
- IT ESR (electron spin resonance)  
(spectroscopic study of silyl radical expulsion from silylated cyclohexadienes, prepd. as radical chain reducing reagents)
- IT 75-03-6, Ethyl iodide 75-30-9, Isopropyl iodide 558-17-8, tert-Butyl iodide  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(addn. to Ph vinyl sulfone; reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)
- IT 78-94-4, Methyl vinyl ketone, reactions 96-33-3, Methyl acrylate 107-13-1, Acrylonitrile, reactions 5535-48-8, Phenyl vinyl sulfone 20451-53-0, Phenyl vinyl sulfoxide  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(coupling with haloalkanes; reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)
- IT 24892-63-5, Allyl 2-iodophenyl ether  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(intramol. cyclization; reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)
- IT 612-17-9, 1,4-Dihydronaphthalene 613-31-0, 9,10-Dihydroanthracene 628-41-1, 1,4-Cyclohexadiene 2886-59-1, 1-Methoxy-1,4-cyclohexadiene 13154-24-0, Triisopropylchlorosilane 18162-48-6, (tert-Butyl)dimethylsilyl chloride 37567-78-5, 1,5-Dimethoxy-1,4-cyclohexadiene 67373-56-2, Thexyldimethylchlorosilane  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(prepn. of silylated cyclohexadienes as **radical** chain reducing reagents for reductive defunctionalization, cyclization, intermol. addn. reactions and as **polymn.** regulators)
- IT 55861-03-5  
RL: RCT (Reactant); RGT (Reagent); RACT (Reactant or reagent)  
(prepn. of silylated cyclohexadienes as **radical** chain reducing reagents for reductive defunctionalization, cyclization, intermol. addn. reactions and as **polymn.** regulators)
- IT 304915-84-2P 356070-11-6P 544445-73-0P  
RL: RCT (Reactant); RGT (Reagent); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. of silylated cyclohexadienes as **radical** chain reducing reagents for reductive defunctionalization, cyclization, intermol. addn. reactions and as **polymn.** regulators)
- IT 503299-91-0P 544445-98-9P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. of silylated cyclohexadienes as **radical** chain reducing reagents for reductive defunctionalization, cyclization, intermol. addn. reactions and as **polymn.** regulators)

IT 68573-95-5P 304915-85-3P 304915-86-4P 304915-87-5P 544445-66-1P  
544445-75-2P 544445-77-4P 544445-87-6P

RL: RGT (Reagent); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. of silylated cyclohexadienes as **radical** chain reducing reagents for reductive defunctionalization, cyclization, intermol. addn. reactions and as **polymn.** regulators)

IT 90-11-9, 1-Bromonaphthalene 693-58-3, 1-Bromononane 768-90-1,  
1-Bromoadamantane 768-93-4, 1-Iodoadamantane 935-56-8,  
1-Chloroadamantane 1925-58-2, endo-3-Bromocamphor 7314-85-4,  
2-Bromoadamantane **16667-96-2** 19189-62-9 121410-95-5  
287411-76-1

RL: RCT (Reactant); RACT (Reactant or reagent)

(reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)

IT 76-22-2P, Camphor 91-20-3P, Naphthalene, preparation 108-11-2P,  
4-Methyl-2-pentanol 111-84-2P, Nonane 281-23-2P, Adamantane  
294-62-2P, Cyclododecane 4613-62-1P 13148-83-9P 13524-73-7P,  
3-Methyl-2,3-dihydrobenzofuran 16823-62-4P 29542-59-4P 52075-20-4P  
52582-89-5P 81536-20-1P 113249-47-1P 113273-51-1P 126002-57-1P

RL: SPN (Synthetic preparation); PREP (Preparation)

(reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)

IT 107986-99-2

RL: RCT (Reactant); RACT (Reactant or reagent)

(ring expansion; reductive defunctionalization, ring expansion, cyclization and intermol. addn. reactions using silylated cyclohexadienes as radical chain reducing reagents)

IT 1605-73-8, tert-Butyl radical 2143-61-5, Propyl radical 58405-27-9  
96574-64-0 544446-31-3 544708-67-0

RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)

(spectroscopic study of silyl radical expulsion from silylated cyclohexadienes, prepd. as radical chain reducing reagents)

IT 544708-53-4

RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)

(spectroscopic study of silyl radical expulsion from silylated cyclohexadienes, prepd. as radical chain reducing reagents)

IT 100-42-5, Styrene, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(styrene **polymn.** using silylated cyclohexadienes as **radical** chain reducing reagents)

IT 9003-53-6P, Polystyrene

RL: SPN (Synthetic preparation); PREP (Preparation)

(styrene **polymn.** using silylated cyclohexadienes as **radical** chain reducing reagents)

RE.CNT 57 THERE ARE 57 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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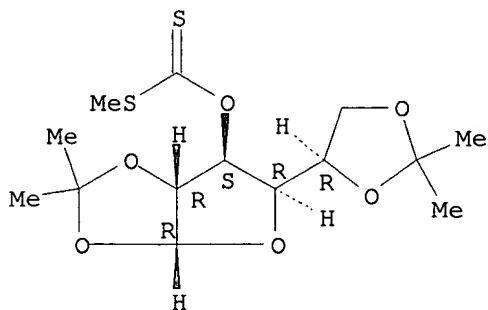
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RL: RCT (Reactant); RACT (Reactant or reagent)  
(reductive defunctionalization, ring expansion, cyclization and  
intermol. addn. reactions using silylated cyclohexadienes as radical  
chain reducing reagents)

RN 16667-96-2 HCAPLUS

CN .alpha.-D-Glucofuranose, 1,2:5,6-bis-O-(1-methylethylidene)-, S-methyl  
carbonodithioate (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



L19 ANSWER 4 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2003:203585 HCAPLUS

DN 138:369242

TI Thiocarbonylthio Compounds (S:C(Z)S-R) in Free Radical  
**Polymerization** with Reversible Addition-Fragmentation  
**Chain Transfer** (RAFT **Polymerization**). Effect  
of the Activating Group Z

AU Chiefari, John; Mayadunne, Roshan T. A.; Moad, Catherine L.; Moad, Graeme;  
Rizzardo, Ezio; Postma, Almar; Skidmore, Melissa A.; Thang, San H.

CS CSIRO Molecular Science, Clayton South, 3169, Australia

SO Macromolecules (2003), 36(7), 2273-2283

CODEN: MAMOBX; ISSN: 0024-9297

PB American Chemical Society

DT Journal

LA English

CC 35-3 (Chemistry of Synthetic High **Polymers**)

AB Free-radical **polymn.** in the presence of suitable

addn.-fragmentation **chain transfer** agents [S:C(Z)S-R]

(RAFT agents) possess the characteristics of a living **polymn.**

(i.e., polymer products can be reactivated for **chain** extension

and/or block synthesis, mol. wts. are predetd. by RAFT agent concn. and

conversion, narrow polydispersities are possible). Styrene **polymns.** (110

.degree.C, thermal initiation) were performed for two series of RAFT

agents [S:C(Z)S-CH<sub>2</sub>Ph and S:C(Z)S-C(Me)<sub>2</sub>CN]. The **chain**

**transfer** coeffs. decrease in the series where Z is Ph > SCH<sub>2</sub>Ph

.apprx. SMe .apprx. Me .apprx. N-pyrrolo .mchgt. OC6F<sub>5</sub> > N-lactam > OC6H<sub>5</sub>

> O(alkyl) .mchgt. N(alkyl)<sub>2</sub> (only the first five in this series provide

narrow polydispersity polystyrene (< 1.2) in batch **polymn.**).

More generally, **chain transfer** coeffs. decrease in the

series dithiobenzoates > trithiocarbonates .apprx. dithioalkanoates >

dithiocarbonates (xanthates) > dithiocarbamates. However,

electron-withdrawing substituents on Z can enhance the activity of RAFT

agents to modify the above order. Thus, substituents that render the

oxygen or nitrogen lone pair less available for delocalization with the



C:S can substantially enhance the effectiveness of xanthates or dithiocarbamates, resp. The trend in relative effectiveness of the RAFT agents is rationalized in terms of interaction of Z with the C:S double bond to activate or deactivate that group toward free radical addn. MO calcns. and the estd. LUMO energies of the RAFT agents can be used in a qual. manner to predict the effect of the Z substituent on the activity of RAFT agents.

ST thiocarbonylthio **chain transfer** agent styrene  
**polymn** RAFT

IT **Chain transfer** agents

(effect of activating group Z on thiocarbonylthio compds. (S:C(Z)S-R) in free **radical polymn.** of styrene with reversible addn.-fragmentation **chain transfer**)

IT **Polymerization**

**Polymerization** catalysts

(**radical**; effect of activating group Z on thiocarbonylthio compds. (S:C(Z)S-R) in free **radical polymn.** of styrene with reversible addn.-fragmentation **chain transfer**)

IT 100-42-5, Styrene, reactions

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(effect of activating group Z on thiocarbonylthio compds. (S:C(Z)S-R) in free **radical polymn.** of styrene with reversible addn.-fragmentation **chain transfer**)

IT 3052-61-7 **24472-74-0** 26504-29-0 27249-90-7 32894-08-9  
60795-38-2 201611-85-0 223264-13-9 223264-15-1 227205-57-4  
**227205-64-3** 500898-10-2

RL: MOA (Modifier or additive use); USES (Uses)

(effect of activating group Z on thiocarbonylthio compds. (S:C(Z)S-R) in free **radical polymn.** of styrene with reversible addn.-fragmentation **chain transfer**)

IT 9003-53-6P, Polystyrene

RL: SPN (Synthetic preparation); PREP (Preparation)  
(effect of activating group Z on thiocarbonylthio compds. (S:C(Z)S-R) in free **radical polymn.** of styrene with reversible addn.-fragmentation **chain transfer**)

IT 75-15-0, Carbon disulfide, reactions 78-67-1, AIBN 98-83-9,  
.alpha.-Methylstyrene, reactions 100-39-0, Benzyl bromide 100-44-7,  
Benzyl chloride, reactions 100-53-8, Benzylmercaptan 109-97-7, Pyrrole  
148-18-5, Sodium N,N-diethyldithiocarbamate 463-71-8, Thiophosgene  
771-61-9, Pentafluorophenol 1005-56-7, Phenyl thionochloroformate  
5675-79-6 71408-15-6, 2-Pyrrolidone-1-carbodithioic acid 73505-24-5

RL: RCT (Reactant); RACT (Reactant or reagent)

(in prepn. of thiocarbonylthio compds. (S:C(Z)S-R) for **radical polymn.** of styrene with reversible addn.-fragmentation **chain transfer**)

IT 594-03-6P, Dithioacetic acid 37912-22-4P . 135192-53-9P, Perfluorophenyl chlorothioformate

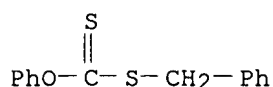
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(in prepn. of thiocarbonylthio compds. (S:C(Z)S-R) for **radical polymn.** of styrene with reversible addn.-fragmentation **chain transfer**)

RE.CNT 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

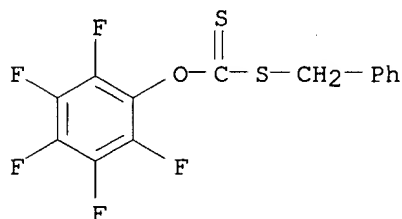
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- IT 24472-74-0 227205-64-3  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (effect of activating group Z on thiocarbonylthio compds. (S:C(Z)S-R)  
 in free **radical polymn.** of styrene with reversible  
 addn.-fragmentation **chain transfer**)
- RN 24472-74-0 HCAPLUS  
 CN Carbonodithioic acid, O-phenyl S-(phenylmethyl) ester (9CI) (CA INDEX  
 NAME)



RN 227205-64-3 HCAPLUS

CN Carbonodithioic acid, O-(pentafluorophenyl) S-(phenylmethyl) ester (9CI)  
(CA INDEX NAME)



L19 ANSWER 5 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2003:199711 HCAPLUS

DN 138:369241

TI Influence of the Chemical Structure of MADIX Agents on the RAFT  
Polymerization of Styrene

AU Adamy, Monique; van Herk, Alex M.; Destarac, Mathias; Monteiro, Michael J.  
CS Laboratory of Polymer Chemistry (SPC), Eindhoven University of Technology,  
Eindhoven, 5600, Neth.

SO Macromolecules (2003), 36(7), 2293-2301  
CODEN: MAMOBX; ISSN: 0024-9297

PB American Chemical Society

DT Journal

LA English

CC 35-3 (Chemistry of Synthetic High **Polymers**)

AB Xanthates (MADIX agents) are an important class of RAFT agents. Currently, they are the only "living" agent that can be successfully used in a classical ab initio emulsion **polymn.** (i.e., where surfactant micelles are used as microreactors for **polymn.**), in which novel nanostructures can be prepd. The compn. and mol. wt. distribution (MWD) controls to a large extent the morphol. of these nanostructures. A key factor that controls the MWD is the **chain transfer** ability of the MADIX agents. Three MADIX agents with different leaving groups (Me benzyl or Et propionyl) and different activating moieties (O-Et or O-trifluoroethyl) were examd. for their **chain transfer** ability in the homopolymn. of styrene. The **chain transfer** consts., Ctr, were detd. using both the Mayo and **chain** length distribution methods. This is the first comprehensive study in which accurate activation parameters for MADIX agents have been elucidated for styrene polymns. The activation parameters from both methods showed that changing the Z group on the MADIX agent from a OCH<sub>2</sub>CH<sub>3</sub> (Ctr = 0.69) to a OCH<sub>2</sub>CF<sub>3</sub> (Ctr=3.5) lowered the Ea, tr by at least 5 kJ mol<sup>-1</sup>. This suggests that when the electron-withdrawing power on the Z group is increased, the reactivity of polystyrene radicals toward the S:C bond is also increased. This is opposite to what is found when electron-donating Z groups are used (e.g., Ph or benzyl groups), in which the Ctr values are actually orders of magnitude greater than for

OCH<sub>2</sub>CF<sub>3</sub>, suggesting that the radical reactions to RAFT agents is more complex than to C:C bonds. It is postulated that the transition state of the intermediate radical plays an important role in the overall Ctr value. The confidence contour plots showed that the activation parameters for the O-Et xanthates with different leaving groups (C(CH<sub>3</sub>)Ph and C(CH<sub>3</sub>)CO<sub>2</sub>Et) were completely overlapping, suggesting that these leaving groups have little or no effect on the Ctr values. The O-trifluoroethyl xanthate allows the prepn. of polymers with controlled mol. wts. and low polydispersities close to 1.4 to be prepd., which is a distinct improvement on the first generation MADIX agents, O-Et xanthates (polydispersity close to 2).

- ST RAFT **chain transfer** agent effect styrene  
**polymn** kinetics
- IT Polymerization  
(bulk; in prepn. of polystyrene by RAFT **polymn.**)
- IT Simulation and Modeling, physicochemical  
(in prepn. of polystyrene by RAFT **polymn.**)
- IT Activation energy  
**Chain transfer** agents  
(influence of chem. structure of MADIX agents on RAFT **polymn.** of styrene)
- IT Molecular weight  
Polydispersity  
(of polystyrene prepd. by RAFT **polymn.**)
- IT **Polymerization**  
**Polymerization** kinetics  
(**radical**, RAFT; influence of chem. structure of MADIX agents on RAFT **polymn.** of styrene)
- IT Polymerization  
(soln.; in prepn. of polystyrene by RAFT **polymn.**)
- IT **73232-07-2 123972-86-1 312731-30-9**  
RL: MOA (Modifier or additive use); USES (Uses)  
(**chain transfer** agents; influence of chem. structure of MADIX agents on RAFT **polymn.** of styrene)
- IT 9003-53-6P, Polystyrene  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(influence of chem. structure of MADIX agents on RAFT **polymn.** of styrene)
- IT 100-42-5, Styrene, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(influence of chem. structure of MADIX agents on RAFT **polymn.** of styrene)

RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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IT 73232-07-2 123972-86-1 312731-30-9

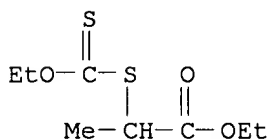
RL: MOA (Modifier or additive use); USES (Uses)

(**chain transfer** agents; influence of chem.

structure of MADIX agents on RAFT **polymn.** of styrene)

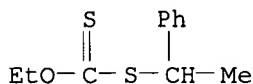
RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



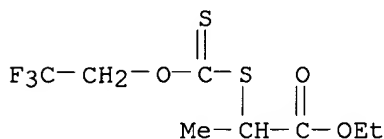
RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



RN 312731-30-9 HCAPLUS

CN Propanoic acid, 2-[[thioxo(2,2,2-trifluoroethoxy)methyl]thio]-, ethyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 6 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:160200 HCAPLUS  
 DN 138:369280  
 TI Automated parallel synthesis of MADIX (Co)polymers  
 AU Chapon, Pascal; Mignaud, Catherine; Lizarraga, Gilda; Destarac, Mathias  
 CS Rhodia Recherches, Centre de Recherches d'Aubervilliers, Aubervilliers, 93308, Fr.  
 SO Macromolecular Rapid Communications (2003), 24(1), 87-91  
 CODEN: MRCOE3; ISSN: 1022-1336  
 PB Wiley-VCH Verlag GmbH & Co. KGaA  
 DT Journal  
 LA English  
 CC 35-4 (Chemistry of Synthetic High **Polymers**)  
 AB An automated parallel approach was developed for synthesizing polymer libraries by the macromol. design via the interchange of xanthates (MADIX) process. The xanthates act as reversible chain transfer agents in, e.g., radical polymns. The exptl. set-up, parallel polymns., characterization, and reproducibility tests are described. The method is illustrated with examples of synthesis of acrylic, i.e., Bu acrylate and Et acrylate and their diblock copolymer combinatorial libraries.  
 ST butyl acrylate radical **polymn** xanthate **chain transfer** mechanism; parallel **polymn** MADIX process xanthate **chain transfer**  
 IT Combinatorial library  
 (MADIX polymer; automated equipment and MADIX process of parallel synthesis of polymers using xanthate chain transfer agents)  
 IT Chain transfer agents  
 (automated equipment and MADIX process of parallel synthesis of polymers using xanthate chain transfer agents)  
 IT Chain transfer  
 (mechanism; automated equipment and MADIX process of parallel synthesis of polymers using xanthate chain transfer agents)  
 IT **Polymerization**  
 (**radical**, MADIX; automated equipment and MADIX process of parallel synthesis of polymers using xanthate **chain transfer** agents)  
 IT 9003-32-1P, Ethyl acrylate homopolymer 9003-49-0P, Butyl acrylate homopolymer 172905-57-6P, Butyl acrylate-ethyl acrylate block copolymer  
 RL: CPN (Combinatorial preparation); SPN (Synthetic preparation); CMBI (Combinatorial study); PREP (Preparation)  
 (automated equipment and MADIX process of parallel synthesis of polymers using xanthate chain transfer agents)  
 IT **73232-07-2**, S-(1-Ethoxycarbonyl)ethyl-O-ethyl xanthate **312731-30-9**  
 RL: CST (Combinatorial study, unclassified); RGT (Reagent); CMBI (Combinatorial study); RACT (Reactant or reagent)  
 (**chain transfer** agent; automated equipment and MADIX process of parallel synthesis of polymers using xanthate **chain transfer** agents)  
 IT 78-67-1, AIBN  
 RL: CAT (Catalyst use); CST (Combinatorial study, unclassified); CMBI (Combinatorial study); USES (Uses)  
 (radical initiator; automated equipment and MADIX process of parallel synthesis of polymers using xanthate chain transfer agents)  
 RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE  
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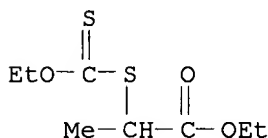
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- (23) Zhang, H; Polym Prepr (Am Chem Soc Div Polym Chem) 2002, V43(2), P17 HCAPLUS

IT 73232-07-2, S-(1-Ethoxycarbonyl)ethyl-O-ethyl xanthate  
312731-30-9

RL: CST (Combinatorial study, unclassified); RGT (Reagent); CMBI  
(Combinatorial study); RACT (Reactant or reagent)  
(**chain transfer** agent; automated equipment and  
MADIX process of parallel synthesis of polymers using xanthate  
**chain transfer** agents)

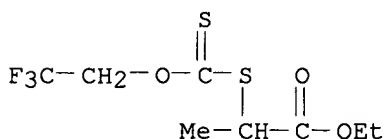
RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



RN 312731-30-9 HCAPLUS

CN Propanoic acid, 2-[[thioxo(2,2,2-trifluoroethoxy)methyl]thio]-, ethyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 7 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:134483 HCAPLUS  
 DN 138:354282  
 TI Block copolymers of acrylic acid and butyl acrylate prepared by reversible addition-fragmentation **chain transfer polymerization**: synthesis, characterization, and use in emulsion **polymerization**  
 AU Gaillard, Nicolas; Guyot, Alain; Claverie, Jerome  
 CS Laboratoire de Chimie et Procédés de Polymerization, Centre National de la Recherche Scientifique, Ecole de Chimie Physique Electronique de Lyon, Centre National de la Recherche Scientifique, Villeurbanne, Fr.  
 SO Journal of Polymer Science, Part A: Polymer Chemistry (2003), 41(5), 684-698  
 CODEN: JPACEC; ISSN: 0887-624X  
 PB John Wiley & Sons, Inc.  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB Amphiphilic block copolymers of poly(acrylic acid-b-Bu acrylate) (I) were prepd. by reversible addn.-fragmentation **chain transfer polymn.** in a one-pot reaction. I were characterized by NMR, static and dynamic light scattering, tensiometry, and size exclusion chromatog. The aggregation characteristics of I corresponded to those theor. predicted for a star micelle. In a Bu acrylate-Me methacrylate emulsion copolymn., low amts. of I could stabilize the latexes with solid contents up to 50%.  
 ST reversible addn fragmentation block polymn acrylic  
 IT Emulsifying agents  
     (block acrylic polymers; for polymn. of Bu acrylate with Me methacrylate)  
 IT Polymerization kinetics  
     (block; of Bu acrylate with acrylic acid by reversible addn. fragmentation transfer)  
 IT pH  
     (effect on crit. micelle concn. of acrylic acid-Bu acrylate block copolymers prepd. by reversible addn. fragmentation transfer)  
 IT **Polymerization**  
     (emulsion, **radical**; of Bu acrylate with Me methacrylate in presence of acrylic block polymer)  
 IT **Chain transfer** agents  
     (for block **polymn.** of Bu acrylate with acrylic acid by reversible addn. fragmentation **transfer**)  
 IT Surface area  
     (of Bu acrylate-Me methacrylate copolymer latexes prepd. in presence of acrylic block polymer)  
 IT Critical micelle concentration  
     Micelles  
     Radius of gyration  
         (of acrylic acid-Bu acrylate block copolymer prepd. by reversible addn. fragmentation transfer)  
 IT 26504-29-0 **123972-86-1**  
     RL: CAT (Catalyst use); USES (Uses)  
         (**chain transfer** agent; in prepn. of acrylic acid-Bu acrylate block copolymer by RAFT **polymn.**)  
 IT 121917-48-4P, Acrylic acid-butyl acrylate block copolymer  
     RL: POF (Polymer in formulation); PRP (Properties); SPN (Synthetic



preparation); PREP (Preparation); USES (Uses)  
 (diblock; prepn. by reversible addn.-fragmentation **chain**  
**transfer polymn.** and use in emulsion **polymn**  
 .)

- IT 79-10-7, Acrylic acid, reactions  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (kinetics of RAFT polymn. with Bu acrylate)
- IT 141-32-2, Butyl acrylate  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (kinetics of RAFT polymn. with acrylic acid)
- IT 25852-37-3P, Butyl acrylate-methyl methacrylate copolymer  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. by emulsion polymn. in presence of acrylic block polymer)

RE.CNT 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

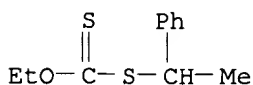
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IT 123972-86-1

RL: CAT (Catalyst use); USES (Uses)  
 (**chain transfer** agent; in prepn. of acrylic acid-Bu  
 acrylate block copolymer by RAFT **polymn.**)

RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX  
 NAME)



- L19 ANSWER 8 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:109509 HCAPLUS  
 DN 138:338533  
 TI Xanthates as **chain-transfer** agents in controlled radical **polymerization** (MADIX): Structural effect of the O-alkyl group  
 AU Destarac, Mathias; Bzducha, Wojciech; Taton, Daniel; Gauthier-Gillaizeau, Isabelle; Zard, Samir Z.  
 CS Rhodia Recherches, Cent. de Recherches d'Aubervilliers, Aubervilliers, 93308, Fr.  
 SO Macromolecular Rapid Communications (2002), 23(17), 1049-1054  
 CODEN: MRCOE3; ISSN: 1022-1336  
 PB Wiley-VCH Verlag GmbH & Co. KGaA  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 Section cross-reference(s): 23, 29  
 AB The capability of three **chain-transfer** agents, O-alkyl-S-(1-ethoxycarbonyl)ethyl xanthates (MeEtCHCO<sub>2</sub>)S(C:S)OR (I), to control the free-radical **polymn.** of styrene and Et acrylate by the MADIX process was examd. The reactivity of the xanthates varied according to the following trend: I R = Et < CH<sub>2</sub>CF<sub>3</sub> < CH[P(O)(OEt)<sub>2</sub>]CF<sub>3</sub>. This change in reactivity allowed a lowering of the polydispersity index from 2.0 for I R = Et to 1.15 for I R = CH[P(O)(OEt)<sub>2</sub>]CF<sub>3</sub> in the case of the **polymn.** of styrene.  
 ST xanthate ethoxycarbonylethyl **chain transfer** agent  
**polymn** acrylate styrene  
 IT Molecular weight  
 Molecular weight distribution  
 (of polystyrene and poly(Et acrylate) prepd. in presence of xanthate chain-transfer agents)  
 IT **Chain transfer** agents  
 (xanthate **chain-transfer** agents in controlled radical **polymn.** of styrene and Et acrylate)  
 IT 9003-32-1P, Poly(ethyl acrylate) 9003-53-6P, Polystyrene  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. in presence of xanthate chain-transfer agents)  
 IT **73232-07-2 312731-30-9 344404-27-9**  
 RL: CAT (Catalyst use); USES (Uses)  
 (xanthate **chain-transfer** agents in controlled radical **polymn.** of styrene and Et acrylate)  
 RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE  
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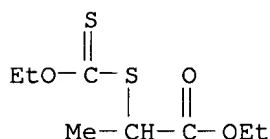
IT 73232-07-2 312731-30-9 344404-27-9

RL: CAT (Catalyst use); USES (Uses)

(xanthate **chain-transfer** agents in controlled  
**radical polymn.** of styrene and Et acrylate)

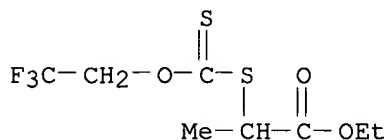
RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



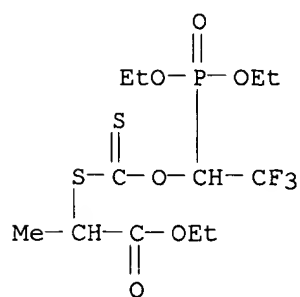
RN 312731-30-9 HCAPLUS

CN Propanoic acid, 2-[[thioxo(2,2,2-trifluoroethoxy)methyl]thio]-, ethyl ester (9CI) (CA INDEX NAME)



RN 344404-27-9 HCAPLUS

CN 3,6-Dioxa-8-thia-4-phosphadecan-10-oic acid, 4-ethoxy-9-methyl-7-thioxo-5-(trifluoromethyl)-, ethyl ester, 4-oxide (9CI) (CA INDEX NAME)



- L19 ANSWER 9 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:109185 HCAPLUS  
 DN 138:338531  
 TI Macromolecular design via the interchange of xanthates (MADIX):  
 polymerization of styrene with O-ethyl xanthates as controlling agents  
 AU Destarac, Mathias; Brochon, Cyril; Catala, Jean-Marie; Wilczewska,  
 Agnieszka; Zard, Samir Z.  
 CS Rhodia Recherches, Aubervilliers, 93308, Fr.  
 SO Macromolecular Chemistry and Physics (2002), 203(16), 2281-2289  
 CODEN: MCHPES; ISSN: 1022-1352  
 PB Wiley-VCH Verlag GmbH & Co. KGaA  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 Section cross-reference(s): 23, 25  
 AB Control of the free-radical **polymn.** of styrene was achieved  
 using a series of eight xanthates of the general structure RS(C=S)OEt as  
 reversible addn. fragmentation **chain-transfer** agents.  
 The influence of the nature of the R leaving group was explored. It was  
 found that the **transfer** ability of the xanthate is markedly  
 improved with increasing stability of R and its steric hindrance. The R  
 group strongly influences the **hivin.Mn** evolution profile during  
**polymn.**, but only influences the polydispersities to a small  
 extent. The cyanoisopropyl group was shown to be the best leaving group,  
 leading to an increase in the mol. wt. during **polymn.** that was  
 close to linearity. The living character of the **polymn.** and the  
 high purity of the **chain** structures were supported by data from  
 matrix-assisted laser desorption ionization time-of-flight (MALDI-TOF)  
 mass spectrometry and <sup>13</sup>C NMR spectroscopy. A zero-order dependence of  
 the kinetics of **polymn.** on the xanthate concn. was obsd.  
 ST xanthate **chain transfer** agent kinetics radical  
**polymn** styrene  
 IT **Chain transfer** kinetics  
 (in **polymn.** of styrene in presence of Et xanthate  
**chain-transfer** agents)  
 IT Molecular weight  
 Molecular weight distribution  
 (of polystyrene prep. in presence of Et xanthate chain-transfer  
 agents)  
 IT **Chain transfer** agents  
 (prepn. of Et xanthates as **chain-transfer** agents  
 for **polymn.** of styrene)  
 IT **Polymerization** kinetics  
 (**radical**; of styrene in presence of Et xanthate **chain**

- transfer agents)
- IT 218966-80-4  
RL: CAT (Catalyst use); USES (Uses)  
(Et xanthates as **chain-transfer** agents for **polymn.** of styrene)
- IT 6625-04-3P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(intermediate; prepn. of Et xanthates as **chain-transfer** agents for **polymn.** of styrene)
- IT 100-42-5, Styrene, reactions  
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
(kinetics of **polymn.** in presence of Et xanthate **chain-transfer** agents)
- IT 9003-53-6P, Polystyrene  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(prepn. in presence of Et xanthate chain-transfer agents)
- IT 29651-92-1P 73232-07-2P 123972-86-1P  
218966-75-7P 218966-77-9P 357268-50-9P  
474418-96-7P  
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(prepn. of Et xanthates as **chain-transfer** agents for **polymn.** of styrene)
- IT 94-41-7, Chalcone 98-83-9, .alpha.-Methylstyrene, reactions 106-48-9,  
4-Chlorophenol 140-89-6 535-11-5, Ethyl 2-bromopropionate 585-71-7,  
(1-Bromoethyl)benzene 685-87-0, Diethyl bromomalonate 7623-09-8,  
2-Chloropropionyl chloride 84938-90-9  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(starting material; prepn. of Et xanthates as **chain-transfer** agents for **polymn.** of styrene)
- RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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  - (19) Mitsukami, Y; Macromolecules 2001, V34, P2248 HCAPLUS
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  - (21) Moad, G; Polym Int 2000, V49, P993 HCAPLUS
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  - (24) Muller, A; Macromolecules 1995, V28, P4326
  - (25) Viehe, H; Angew Chem 1979, V91, P982 HCAPLUS

(26) Viehe, H; Angew Chem Int Ed Engl 1979, V18, P917

(27) Zard, S; Angew Chem 1997, V109, P724

(28) Zard, S; Angew Chem Int Ed Engl 1997, V36, P672

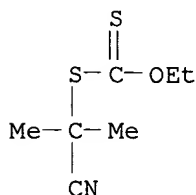
IT 218966-80-4

RL: CAT (Catalyst use); USES (Uses)

(Et xanthates as **chain-transfer** agents for  
**polymn.** of styrene)

RN 218966-80-4 HCAPLUS

CN Carbonodithioic acid, S-(1-cyano-1-methylethyl) O-ethyl ester (9CI) (CA INDEX NAME)



IT 29651-92-1P 73232-07-2P 123972-86-1P

218966-75-7P 218966-77-9P 357268-50-9P

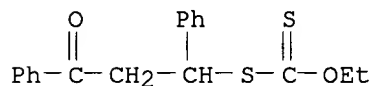
474418-96-7P

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation);  
USES (Uses)

(prep. of Et xanthates as **chain-transfer** agents  
for **polymn.** of styrene)

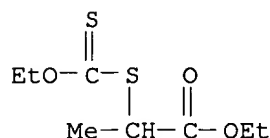
RN 29651-92-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(3-oxo-1,3-diphenylpropyl) ester (9CI)  
(CA INDEX NAME)



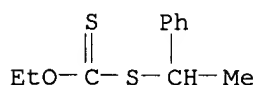
RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



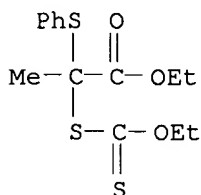
RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



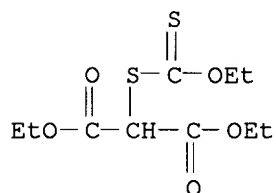
RN 218966-75-7 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-2-(phenylthio)-, ethyl ester (9CI) (CA INDEX NAME)



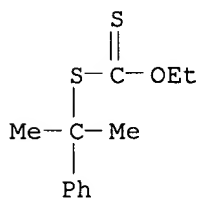
RN 218966-77-9 HCAPLUS

CN Propanedioic acid, [(ethoxythioxomethyl)thio]-, diethyl ester (9CI) (CA INDEX NAME)



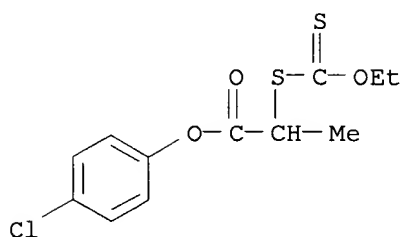
RN 357268-50-9 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-methyl-1-phenylethyl) ester (9CI) (CA INDEX NAME)



RN 474418-96-7 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, 4-chlorophenyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 10 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:22921 HCAPLUS  
 DN 138:73702  
 TI Controlled mini-emulsion free radical polymerization  
 IN Destarac, Mathias; Bzducha, Wojciech  
 PA Rhodia Chimie, Fr.  
 SO PCT Int. Appl., 29 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA French  
 IC ICM C08F002-16  
 CC 35-4 (Chemistry of Synthetic High Polymers)  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003002614	A2	20030109	WO 2002-FR2219	20020626
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	FR 2826658	A1	20030103	FR 2001-8683	20010629
PRAI	FR 2001-8683	A	20010629		
AB	The invention concerns a method for prepg. polymers by free radical polymn. comprising (i) prepg. a mini-emulsion contg.: at least an ethylenically unsatd. monomer, at least a control agent selected among xanthates, dithiocarbamates, thioether-thiones, the xanthates comprising phosphorus and optionally fluorine and dithiophosphoroesters, an aq. soln., a surfactant, and a co-surfactant, and (ii) reacting the mini-emulsion, in the presence of a free radical source, at a sufficient temp. and/or for a sufficient time interval to form the polymers. A Bu acrylate-styrene triblock copolymer was prepd. in the presence of di-Et meso-2,5-di(O-ethylxanthate) adipate.				
ST	mini-emulsion radical polymn mol wt control agent				
IT	<b>Polymerization</b>				
	(radical, mini-emulsion; controlled mini-emulsion free radical polymn.)				
IT	<b>480453-53-0</b>				
	RL: MOA (Modifier or additive use); USES (Uses)				
	(mol. wt. control agent; controlled mini-emulsion free radical polymn.)				



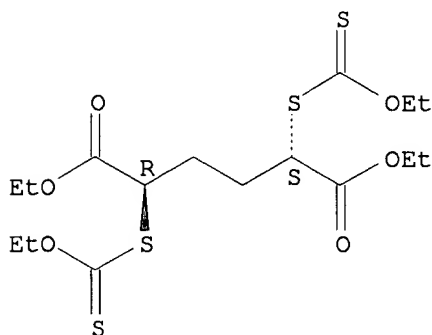
IT 105729-79-1P, Isoprene-styrene block copolymer 106107-54-4P, Butadiene-styrene block copolymer 108080-90-6P 110772-34-4P, Butyl acrylate-styrene block copolymer 114397-35-2P, Ethyl acrylate-styrene block copolymer 127972-36-5P, tert-Butyl acrylate-styrene block copolymer 135911-78-3P, Butyl acrylate-vinyl acetate block copolymer 136745-90-9P, Styrene-vinylpyridine block copolymer  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (triblock; controlled mini-emulsion free **radical** **polymn.**)

IT **480453-53-0**  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (mol. wt. control agent; controlled mini-emulsion free **radical** **polymn.**)

RN 480453-53-0 HCAPLUS

CN erythro-Hexaric acid, 3,4-dideoxy-2,5-dithio-, diethyl ester, bis(O-ethyl carbonodithioate) (9CI) (CA INDEX NAME)

Relative stereochemistry.



L19 ANSWER 11 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:960283 HCAPLUS  
 DN 138:40050  
 TI Preparation of vinyl chloride polymers with narrow molecular weight distribution  
 IN Cho, Min De; Tsuji, Yoshitaro; Hihiro, Tomoki  
 PA Kanegafuchi Chemical Industry Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 16 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM C08F014-06  
 ICS C08F004-00  
 CC 37-3 (Plastics Manufacture and Processing)  
 Section cross-reference(s): **35**

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002363217	A2	20021218	JP 2001-165027	20010531
PRAI JP 2001-165027		20010531		

AB The title polymers contg. .gtoreq.40% of vinyl chloride units have a mol. wt. distribution (Mw/Mn, detd. by GPC) of .ltoreq.1.7. The polymers are prepd. by reversible addn.-fragmentation **chain transfer** (RAFT) **polymn.** using thiocarbonyl compds. as **chain**

**transfer** agents. Thus, vinyl chloride was **polymd.** in the presence of AIBN and O-ethyl-S-cyanomethylxanthate in benzene to give PVC with Mn 14,500 and Mw/Mn 1.38.

ST addn fragmentation **chain transfer** polym vinyl chloride; RAFT **polymn** vinyl chloride thiocarbonyl compd **chain transfer** agent

IT **Chain transfer** agents  
(dithiocarbamates; prepn. of vinyl chloride resins with narrow mol. wt. distribution by RAFT **polymn.**)

IT **Polymerization**  
(**living, radical**, RAFT; prepn. of vinyl chloride resins with narrow mol. wt. distribution)

IT **59463-54-6**, O-Ethyl-S-cyanomethylxanthate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**chain transfer** agents; prepn. of vinyl chloride resins with narrow mol. wt. distribution)

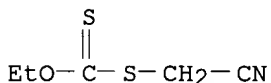
IT 9002-86-2P, PVC  
RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)  
(prepn. of vinyl chloride resins with narrow mol. wt. distribution)

IT 76926-16-4  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(prepn. of vinyl chloride resins with narrow mol. wt. distribution)

IT **59463-54-6**, O-Ethyl-S-cyanomethylxanthate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**chain transfer** agents; prepn. of vinyl chloride resins with narrow mol. wt. distribution)

RN 59463-54-6 HCAPLUS

CN Carbonodithioic acid, S-(cyanomethyl) O-ethyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 12 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:868976 HCAPLUS

DN 137:353535

TI Copolymer with surfactant blocks prepared by controlled free radical polymerization

IN Adam, Herve; Herve, Pascal; Joanicot, Mathieu; Liu, Wan-Li; Talingting, Maria Ruela

PA Rhodia Chimie, Fr.

SO PCT Int. Appl., 21 pp.  
CODEN: PIXXD2

DT Patent

LA French

IC ICM C08F293-00  
ICS C11D003-37; C09D153-00

CC 35-4 (Chemistry of Synthetic High **Polymers**)  
Section cross-reference(s): 42, 46

FAN.CNT 9

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002090409	A2	20021114	WO 2002-FR1349	20020419
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,				

GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
 LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,  
 PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,  
 UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU,  
 TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,  
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,  
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

US 2002198347 A1 20021226 US 2002-137945 20020502

PRAI US 2001-288844P P 20010504

AB The invention concerns a copolymer with surfactant blocks comprising  
 .gtoreq.1 hydrophilic block and .gtoreq.1 hydrophobic block prepd. by  
 living or controlled prepn., said copolymer having a no. mol. wt. ranging  
 between 1000 and 50000, preferably between 2000 and 20000, more preferably  
 still between 4000 and 16000, a glass transition temp. of the hydrophobic  
 block less than 30.degree.C, preferably less than 25.degree.C and higher  
 than -100.degree.C, a surface tension less than 60 mN/m, preferably less  
 than 50 mN/n measured at a concn. in demineralized water not more than  
 10-4 M, and the transfer agent having been made inert relative to said  
 free radical polymn. The copolymers are useful in particular in  
 detergents and paints. A typical block copolymer was manufd. by polymn.  
 of 66 g acrylic acid in the presence of AIBN and S-(ethylpropionyl) O-Et  
 xanthate in iso-PrOH-water mixt. at 70.degree. and polymn. of 140 g Bu  
 acrylate at 65.degree. in the presence of addnl. AIBN and the resulting  
 reaction mixt. dild. with Me2CO.

ST block copolymer surfactant manuf; acrylic acid butyl acrylate block  
 copolymer surfactant manuf; ethylpropionyl ethyl xanthate chain transfer  
 agent copolymer surfactant manuf

IT **Polymerization**

(block; copolymers with surfactant blocks prepd. by controlled free  
**radical polymn.** for detergents)

IT **Surfactants**

(copolymers with surfactant blocks prepd. by controlled free  
**radical polymn.**)

IT **Adhesion promoters**

(copolymers with surfactant blocks prepd. by controlled free  
**radical polymn.** for adhesion promoters)

IT **Paints**

(copolymers with surfactant blocks prepd. by controlled free  
**radical polymn.** for adhesion promoters for paints)

IT **Detergents**

(copolymers with surfactant blocks prepd. by controlled free  
**radical polymn.** for detergents)

IT **Humectants**

(copolymers with surfactant blocks prepd. by controlled free  
**radical polymn.** for humectants)

IT **Wetting agents**

(copolymers with surfactant blocks prepd. by controlled free  
**radical polymn.** for wetting agents)

IT **Chain transfer agents**

(thio compds.; copolymers with surfactant blocks prepd. by controlled  
 free **radical polymn.**)

IT **Carboxylic acids, reactions**

RL: RCT (Reactant); RACT (Reactant or reagent)

(thiocarboxylic, esters, **chain-transfer** agents;  
 copolymers with surfactant blocks prepd. by controlled free  
**radical polymn.**)

IT 73232-07-2

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (chain-transfer agent; copolymers with surfactant  
 blocks prepd. by controlled free radical polymn.)

IT 121917-48-4P, Acrylic acid-butyl acrylate block copolymer 474878-07-4P,  
 Acrylamide-butyl acrylate block copolymer

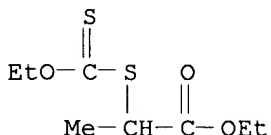
RL: IMF (Industrial manufacture); TEM (Technical or engineered material  
 use); PREP (Preparation); USES (Uses)  
 (copolymers with surfactant blocks prepd. by controlled free  
 radical polymn.)

IT 73232-07-2

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (chain-transfer agent; copolymers with surfactant  
 blocks prepd. by controlled free radical polymn.)

RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA  
 INDEX NAME)



L19 ANSWER 13 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:868964 HCAPLUS

DN 137:353541

TI Method for free radical reduction of dithiocarbonylated or  
 dithiophosphorylated functions borne by a polymer

IN Wilczewska, Zofia Agnieszka; Destarac, Mathias; Zard, Samir; Kalai,  
 Chakib; Mignani, Gerard; Adam, Herve

PA Rhodia Chimie, Fr.

SO PCT Int. Appl., 43 pp.

CODEN: PIXXD2

DT Patent

LA French

IC ICM C08F008-00

ICS C08F002-38; C08C019-30

CC 35-8 (Chemistry of Synthetic High Polymers)

FAN.CNT 9

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002090397	A1	20021114	WO 2002-FR1537	20020503
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
	FR 2829138	A1	20030307	FR 2001-11496	20010905
PRAI	US 2001-288844P	P	20010504		
	US 2001-288846P	P	20010504		

FR 2001-11496 A 20010905

- AB The invention concerns a method for prep. a polymer, comprising a step which consists in contacting: (A) .gtoreq.1 living org. polymer having at its chain end a dithiocarbonylated or dithiophosphorylated function capable of being reactivated; (B) .gtoreq.1 source of free radicals; and (C) .gtoreq.1 org. compd. bearing a labile hydrogen atom, whereby the dithiocarbonylated or dithiophosphorylated function present on said living org. polymer is substituted by a hydrogen atom. This process provides polymers with good control of no.-av. mol. wt. (Mn) and narrow mol.-wt. distribution (Mw/Mn). Thus, polymn. of acrylic acid 4 h in EtOH in the presence of S-(ethylpropionyl) O-Et xanthate and AIBN at 70.degree. gave a polymer with Mn 2950 and Mw/Mn 1.19, and reaction of 20 mL resulting soln. 17 h with 0.37 g dilauroyl peroxide at 80.degree. in the presence of 27.8 mL 2-propanol gave a polymer free of xanthate terminal groups.
- ST radical redn dithiocarbonylated polymer; secondary propanol reaction polyacrylic acid ethylpropionyl ethyl xanthate adduct; dilauroyl peroxide redn polyacrylic acid ethylpropionyl ethyl xanthate adduct; polyacrylic acid ethylpropionyl ethyl xanthate adduct radical redn; dithiophosphorylated polymer radical redn
- IT Chain transfer agents  
(dithiocarbonyl- or dithiophosphoryl compds.; redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)
- IT Acetals  
Silanes  
Thiols (organic), reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(hydrogen-source; redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)
- IT Polymers, preparation  
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(living; redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)
- IT Peroxides, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(radical source; redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)
- IT Polymers, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)
- IT Alcohols, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(secondary, hydrogen-source; redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)
- IT **73232-07-2**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**chain-transfer** agent; redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)
- IT 67-63-0, sec-Propanol, reactions 13598-36-2D, Phosphonic acid, esters

RL: RCT (Reactant); RACT (Reactant or reagent)  
(hydrogen-source; redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)

IT 80-43-3, Dicumyl peroxide 105-74-8, Dilauroyl peroxide 107-71-1, tert-Butyl peroxyacetate 109-13-7, tert-Butyl peroxyisobutyrate 110-05-4, Di-tert-butyl peroxide 614-45-9, tert-Butyl peroxybenzoate 686-31-7, tert-Amyl peroxy-2-ethylhexanoate 762-12-9, Didecanoyl peroxide 3437-84-1, Diisobutyryl peroxide 3457-61-2, tert-Butyl cumyl peroxide 10508-09-5, Di-tert-amyl peroxide 15520-11-3 16215-49-9, Dibutyl peroxydicarbonate 26322-14-5, Dicetyl peroxydicarbonate 26748-38-9, tert-Butyl peroxyneohexanoate 26748-47-0, Cumyl peroxyneodecanoate 29240-17-3, tert-Amyl peroxy-pivalate 43039-86-7 53220-22-7, Dimyristyl peroxydicarbonate 68299-16-1, tert-Amyl peroxyneodecanoate

RL: RCT (Reactant); RACT (Reactant or reagent)  
(radical source; redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)

IT 9003-01-4P, Polyacrylic acid

RL: IMF (Industrial manufacture); PREP (Preparation)  
(redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

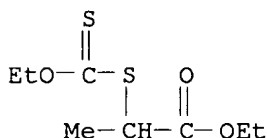
- (1) Borg-Warner Chemicals Inc; EP 0084882 A 1983 HCAPLUS
- (2) Ciba Specialty Chemicals Holding Inc; EP 0849282 A 1998 HCAPLUS
- (3) Rhodia Chimie; FR 2794464 A 2000 HCAPLUS
- (4) Rhodia Chimie; WO 0142312 A 2001 HCAPLUS
- (5) The University Of Akron; WO 0020465 A 2000 HCAPLUS
- (6) Toa Nenryo Kogyo Kabushiki Kaisha; EP 0189672 A 1986 HCAPLUS
- (7) Toa Nenryo Kogyo Kabushiki Kaisha; EP 0243124 A 1987 HCAPLUS

IT 73232-07-2

RL: RCT (Reactant); RACT (Reactant or reagent)  
(**chain-transfer** agent; redn. of dithiocarbonylated or dithiophosphorylated functions borne by living polymers by radical sources in presence of compds. having labile hydrogens)

RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 14 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:696025 HCAPLUS

DN 137:233074

TI Method for controlled free radical polymerization of acrylic acid and salts thereof, resulting low-polydispersity polymers, and their uses

IN Suau, Jean-Marc; Egraz, Jean-Bernard; Claverie, Jerome; Ladaviere, Catherine

PA Coatex S.A.S., Fr.  
 SO PCT Int. Appl., 107 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA French  
 IC ICM C08F020-06  
 ICS C08F002-38  
 CC 35-4 (Chemistry of Synthetic High **Polymers**)  
 Section cross-reference(s): 23

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002070571	A1	20020912	WO 2002-FR722	20020228
	W: BR, CA, CO, CZ, ID, KR, MX, NO, PL, RU, SK, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	FR 2821620	A1	20020906	FR 2001-2848	20010302
	FR 2821620	B1	20030627		
PRAI	FR 2001-2848	A	20010302		
AB	Polymers of acrylic acid or its salts having polydispersity <2 and gel content at conversion >90% are manufd. by free-radical <b>polymn.</b> in the presence of RXC(S)SR' (X = O or S, R = a group causing stabilization of RX function by CX, R' = a group such that the R'S bond is a CS bond) as <b>chain-transfer</b> agents. A typical <b>chain-transfer</b> agent was manuf. by reaction of 8.8 g K O-ethyldithiocarbonate 20 min at 15.degree. with di-Et 2-bromo-2-methylmalonate in water in the presence of Aliquat 336.				
ST	acrylic acid radical <b>polymn chain transfer</b> agent dithioester; dithiocarbonate <b>chain transfer</b> agent acrylate radical <b>polymn</b>				
IT	Chain transfer agents (chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity)				
IT	Cement (chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for cement)				
IT	Detergents (chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for detergents)				
IT	Fillers (chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants for fillers in water)				
IT	Dispersing agents (chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants for inorg. compds. in water)				
IT	Limestone, uses RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses) (chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants for inorg. compds. in water)				
IT	Chalk Clays, processes Kaolin, processes Marble				

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants for inorg. compds. in water)

IT Ceramics

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants in ceramics)

IT Paper

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants in paper manuf.)

IT Inks

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for inks)

IT Leather

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for leather finishes)

IT Petroleum industry

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for petroleum industry)

IT Sizes (agents)

Textiles

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for textile sizes)

IT Varnishes

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for varnishes)

IT Water purification

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for water treatment)

IT Acrylic polymers, uses

RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)

(paint binder; chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants in waterborne paints)

IT Carboxylic acids, preparation

RL: IMF (Industrial manufacture); NUU (Other use, unclassified); PREP (Preparation); USES (Uses)

(thiocarboxylic, esters; chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity)

IT Paints

(water-thinned; chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants in waterborne paints)

IT 6263-65-6, 1-Phenylethanethiol

RL: NUU (Other use, unclassified); USES (Uses)

(chain-transfer agent precursor; chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity)



- IT 100-39-0, Benzyl bromide 109-86-4, 2-Methoxyethanol 140-89-6, Potassium O-ethyldithiocarbonate 1005-56-7, Phenyl chlorothionoformate 3575-19-7, (1-Bromo-1-methylethyl)benzene 6160-65-2, Thiocarbonyldiimidazole 29263-94-3, Diethyl 2-bromo-2-methyl malonate 29364-29-2, Sodium 2-methyl-2-propanethiolate 65944-33-4, Potassium O-(2-methoxyethyl)dithiocarbonate
- RL: RCT (Reactant); RACT (Reactant or reagent)  
(chain-transfer agent precursor; chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity)
- IT 9003-06-9P, Acrylamide-acrylic acid copolymer 9046-92-8P, Acrylic acid-styrenesulfonic acid copolymer 25053-28-5P, Acrylic acid-ethylenesulfonic acid copolymer 25751-21-7P, Acrylic acid-methacrylic acid copolymer 25948-33-8P, Acrylic acid-itaconic acid copolymer 26338-09-0P, Acrylic acid-N-methylolacrylamide copolymer 26659-19-8P, Acrylic acid-methacrylamide copolymer 28062-44-4P, Acrylic acid-vinylpyrrolidone copolymer 28552-55-8P, Acrylic acid-fumaric acid copolymer 29132-58-9P, Acrylic acid-maleic acid copolymer 39373-34-7P 40623-75-4P, 2-Acrylamido-2-methylpropanesulfonic acid-acrylic acid copolymer 53694-17-0P, Acrylic acid-diallyldimethylammonium chloride copolymer 61256-65-3P, Acrylic acid-N-acryloylmorpholine copolymer 63145-32-4P 69841-10-7P, Acrylic acid-sodium methallylsulfonate copolymer 73144-86-2P, Acrylic acid-allylsulfonic acid copolymer 73565-50-1P, Acrylic acid-2-methacryloyloxyethyltrimethylammonium chloride copolymer 78280-50-9P, Acrylic acid-propylene glycol methacrylate copolymer 83548-08-7P, Acrylic acid-methallylsulfonic acid copolymer 103924-59-0P, Acrylic acid-2-methacrylamido-2-methylpropanesulfonic acid copolymer 105062-71-3P, Acrylic acid-2-hydroxy-3-(2-propenyloxy)propanesulfonic acid copolymer 113253-99-9P, Acrylic acid-N-sulfomethylacrylamide copolymer 125167-06-8P, Acrylic acid-N-sulfomethylmethacrylamide copolymer 142175-66-4P, Acrylic acid-3-methacrylamidopropyltrimethylammonium chloride copolymer 152504-88-6P, Acrylic acid-ethylene glycol acrylate phosphate copolymer 157401-89-3P, Acrylic acid-2-methacryloyloxyethyltrimethylammonium sulfate copolymer 457897-46-0P, Acrylic acid-2-hydroxy-3-methacrylamido-1-propanesulfonic acid copolymer 457897-47-1P, Acrylic acid-allyloxybenzenesulfonic acid copolymer 457897-48-2P, Acrylic acid-methallyloxybenzenesulfonic acid copolymer 457897-49-3P, Acrylic acid-sulfopropyl acrylate copolymer 457897-50-6P, Acrylic acid-sulfopropyl methacrylate copolymer 457897-51-7P, Acrylic acid-propenephosphonic acid copolymer 457897-52-8P, Acrylic acid-propylene glycol acrylate phosphate copolymer 457897-53-9P, Acrylic acid-propylene glycol methacrylate phosphate copolymer 457897-54-0P, Acrylic acid-3-methacrylamidopropyltrimethylammonium sulfate copolymer 457899-93-3P 457899-94-4P, Acrylic acid-ethylene glycol acrylate copolymer
- RL: IMF (Industrial manufacture); PREP (Preparation)  
(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity)
- IT **2943-26-2P** 9003-01-4P, Polyacrylic acid 37912-25-7P 357268-45-2P **357268-50-9P 357268-52-1P 357268-53-2P 357268-59-8P 357268-62-3P**
- RL: IMF (Industrial manufacture); NUU (Other use, unclassified); PREP (Preparation); USES (Uses)  
(**chain-transfer** agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity)
- IT 942-91-6 5925-55-3 **24472-74-0** 26504-29-0 27249-90-7

**123972-86-1** 227205-60-9 259195-14-7

RL: NUU (Other use, unclassified); USES (Uses)

(**chain-transfer** agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity)

IT 1317-80-2, Rutile

RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants for inorg. compds. in water)

IT 471-34-1, Calcium carbonate, processes 1309-42-8, Magnesium hydroxide

13397-24-5, Gypsum, processes 13397-26-7, Calcite, processes

13463-67-7, Titania, processes 14807-96-6, Talc, processes 16389-88-1,

Dolomite, processes 21645-51-2, Aluminum hydroxide, processes

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)

(chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants for inorg. compds. in water)

IT 100-42-5D, Styrene, polymers with acrylic monomers 458549-50-3, Mowilith LDM 1871

RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)

(paint binder; chain-transfer agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity for dispersants in waterborne paints)

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) E I Du Pont de Nemours; WO 9801478 A 1998 HCAPLUS

(2) Rhodia Chemie; FR 2794463 A 2000 HCAPLUS

IT **2943-26-2P 357268-50-9P 357268-52-1P**

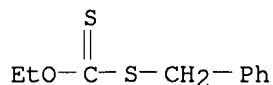
**357268-53-2P 357268-59-8P 357268-62-3P**

RL: IMF (Industrial manufacture); NUU (Other use, unclassified); PREP (Preparation); USES (Uses)

(**chain-transfer** agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity)

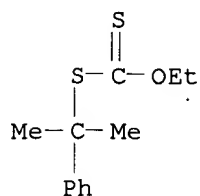
RN 2943-26-2 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



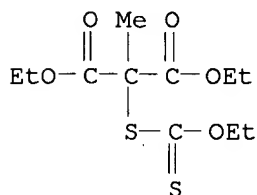
RN 357268-50-9 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-methyl-1-phenylethyl) ester (9CI) (CA INDEX NAME)



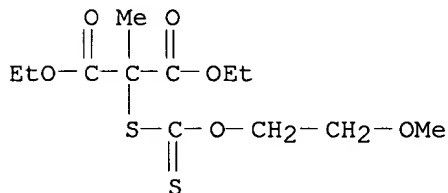
RN 357268-52-1 HCAPLUS

CN Propanedioic acid, [(ethoxythioxomethyl)thio]methyl-, diethyl ester (9CI)  
(CA INDEX NAME)



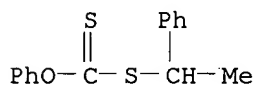
RN 357268-53-2 HCAPLUS

CN Propanedioic acid, [[[2-methoxyethoxy)thioxomethyl]thio]methyl-, diethyl ester (9CI) (CA INDEX NAME)



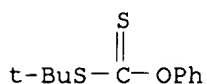
RN 357268-59-8 HCAPLUS

CN Carbonodithioic acid, O-phenyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



RN 357268-62-3 HCAPLUS

CN Carbonodithioic acid, S-(1,1-dimethylethyl) O-phenyl ester (9CI) (CA INDEX NAME)



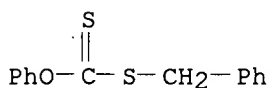
IT 24472-74-0 123972-86-1

RL: NUU (Other use, unclassified); USES (Uses)

(**chain-transfer** agents based on dithioesters for acrylic acid and its salts for manuf. of polymers with very low polydispersity)

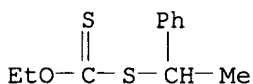
RN 24472-74-0 HCAPLUS

CN Carbonodithioic acid, O-phenyl S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



L19 ANSWER 15 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:625061 HCAPLUS

DN 137:338229

TI Vinylidene chloride copolymerization with methyl acrylate by reversible addition-fragmentation chain transfer (RAFT) process

AU Severac, Romain; Lacroix-Desmazes, Patrick; Colomer, Bruno; Bastaraud, Yannick; Boutevin, Bernard

CS Lab. Chimie Macromoléculaire, UMR-CNRS 5076, Montpellier, 34296, Fr.

SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(2), 124-125

CODEN: ACPPAY; ISSN: 0032-3934

PB American Chemical Society, Division of Polymer Chemistry

DT Journal; (computer optical disk)

LA English

CC 35-4 (Chemistry of Synthetic High **Polymers**)

AB In this work, RAFT was used to synthesize vinylidene chloride/methyl acrylate (VC2/MA) copolymers. Several chain transfer agents with different structures ZC(S)SR were tested. Dithioesters (Z=Ph) proved to be much more efficient than xanthates (Z=OEt) to control VC2/MA copolymn. For dithioesters, Mn increased with conversion (and was close to the theor. Mn), and the kinetics showed a linear trend for Ln([M]0/[M]) vs. time. The dithioester with R=CH(CH3)C(O)OC2H5 lead to the best results, i.e. good control of Mn and smallest retardation effect.

ST methyl acrylate reversible addn fragmentation chain transfer copolymn; reversible addn fragmentation chain transfer copolymn vinylidene chloride; chain transfer agent effect vinylidene chloride copolymn methyl acrylate

IT Chain transfer agents

#### **Polymerization**

(vinylidene chloride copolymn. with Me acrylate by reversible addn.-fragmentation **chain transfer** (RAFT) process in presence of various **chain transfer** agents)

IT 27249-90-7 73232-07-2 412015-83-9 474329-23-2

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (chain transfer agent; vinylidene chloride  
 copolymn. with Me acrylate by reversible addn.-fragmentation  
 chain transfer (RAFT) process in presence of various  
 chain transfer agents)

IT 25038-72-6P, Methyl acrylate-vinylidene chloride copolymer  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (vinylidene chloride copolymn. with Me acrylate by reversible  
 addn.-fragmentation chain transfer (RAFT) process in presence of  
 various chain transfer agents)

RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

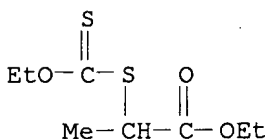
- (1) Asandei, A; J Polym Sci Part A 2001, V39, P3392 HCAPLUS
- (2) Bak, P; US 005455319 A 1995 HCAPLUS
- (3) Charmot, D; Macromol Symp 2000, V150, P23 HCAPLUS
- (4) Chiefari, J; Macromolecules 1998, V31, P5559 HCAPLUS
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- (6) Destarac, M; Macromol Rapid Commun 2000, V21, P1035 HCAPLUS
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- (9) Jo Seong, M; Polym Prepr (Am Chem Soc, Div Polym Chem) 1997, V38, P699
- (10) Matsuo, K; Macromolecules 1977, V10, P654 HCAPLUS
- (11) Matyjaszewski, K; ACS Symp Series 1998, 685, P258
- (12) Matyjaszewski, K; ACS Symp Series 2000, 768, P2
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- (15) Mayadunne, R; Macromolecules 1999, V32, P6977 HCAPLUS
- (16) Moad, G; Polym Int 2000, V49, P993 HCAPLUS
- (17) Monteiro, M; Macromolecules 2001, V34, P349 HCAPLUS
- (18) Percec, V; Macromolecules 1995, V28, P7970 HCAPLUS
- (19) Rizzardo, E; ACS Symp Series 2000, 768, P278
- (20) Rizzardo, E; Polym Prepr (Am Chem Soc, Div Polym Chem) 1999, V40, P342
- (21) Schuh, H; Int J Chem Kinetic 1976, V8, P341 HCAPLUS
- (22) Tatemoto, M; DE 2729671 1978 HCAPLUS
- (23) Veregin, R; Macromolecules 1993, V26, P5316 HCAPLUS
- (24) Wulkow, M; Macromol Theory Simul 1996, V5, P393 HCAPLUS

IT 73232-07-2

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (chain transfer agent; vinylidene chloride  
 copolymn. with Me acrylate by reversible addn.-fragmentation  
 chain transfer (RAFT) process in presence of various  
 chain transfer agents)

RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA  
 INDEX NAME)



L19 ANSWER 16 OF 46 HCAPLUS. COPYRIGHT 2003 ACS on STN  
 AN 2002:624988 HCAPLUS  
 DN 137:353407

- TI Macromolecular design via the interchange of xanthates (the MADIX process): Structural effect of MADIX agents.
- AU Destarac, Mathias; Taton, Daniel; Zard, Samir Z.
- CS Rhodia Recherches, Centre Recherches d'Aubervilliers, Aubervilliers, 93308, Fr.
- SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(2), 116-117  
CODEN: ACPPAY; ISSN: 0032-3934
- PB American Chemical Society, Division of Polymer Chemistry
- DT Journal; (computer optical disk)
- LA English
- CC 35-4 (Chemistry of Synthetic High **Polymers**)
- AB This study demonstrated that the structure of xanthates can be fine-tuned to achieve an optimal control of the MADIX (macromol. design via the interchange of xanthates) process. In O-Et xanthates, the R leaving group only affects the first transfer event in the process, in other terms Ctr(X). Their reactivity could be greatly increased starting from X1 by choosing tertiary groups bearing stabilizing-like cyanoisopropyl or captodative-substituents. The polydispersity is dictated by the PnA(C:S)OEt chain end. The reactivity of the C:S bond is moderated by its conjugation with the electron doublets of the O-Et oxygen atom, resulting in a slow exchange of the dithiocarbonate moiety between chains: therefore, high polydispersities (and low Ctr(PnX) values) are obtained (PDIs .apprx.2). A significant increase in the reactivity of the C:S bond of xanthates was achieved through the incorporation of fluorinated and phosphonated groups in the .beta.-position to the oxygen atom. As a result, polydispersities as low as 1.1 were obtained for both styrene and Et acrylate. Some of the MADIX agents exhibit a very high reactivity, that is comparable to that of other known classes of thiocarbonyl thio compds.
- ST xanthate **chain transfer** agent structure styrene ethyl acrylate **polymn**; macromol design interchange xanthate **chain transfer** agent **polymn**
- IT Polymerization  
(bulk, thermal; structure effect of xanthates on macromol. design via the interchange of xanthates during **polymn**.)
- IT **Chain transfer**  
**Chain transfer** agents  
Molecular weight  
Polydispersity  
(structure effect of xanthates on macromol. design via the interchange of xanthates during **polymn**.)
- IT 73232-07-2 218966-75-7 218966-80-4  
312731-30-9 344404-27-9 474418-96-7  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(structure effect of xanthates on macromol. design via the interchange of xanthates during **polymn**.)
- IT 9003-32-1P, Poly(ethyl acrylate) 9003-53-6P, Polystyrene  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(structure effect of xanthates on macromol. design via the interchange of xanthates during **polymn**.)
- RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
- RE
- (1) Charmot, D; Macromol Symp 2000, V150, P23 HCAPLUS
  - (2) Destarac, M; WO 0075207 2000 HCAPLUS
  - (3) Destarac, M; WO 01042312 2001
  - (4) Destarac, M; Macromol Chem Phys in press

(5) Gaynor, S; Macromolecules 1995, V28, P8051 HCAPLUS

(6) Moad, G; Polym Int 2000, V49, P993 HCAPLUS

(7) Zard, S; Angew Chem Int Ed 1997, V36, P672

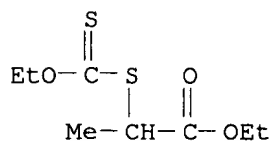
IT 73232-07-2 218966-75-7 218966-80-4

312731-30-9 344404-27-9 474418-96-7

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent) (structure effect of xanthates on macromol. design via the interchange of xanthates during polymn.)

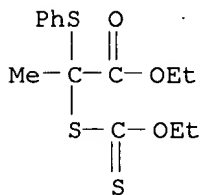
RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



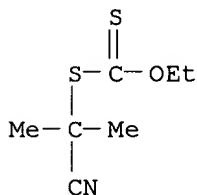
RN 218966-75-7 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-2-(phenylthio)-, ethyl ester (9CI) (CA INDEX NAME)



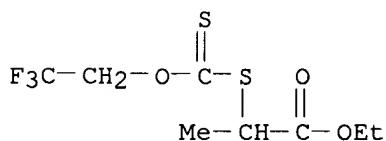
RN 218966-80-4 HCAPLUS

CN Carbonodithioic acid, S-(1-cyano-1-methylethyl) O-ethyl ester (9CI) (CA INDEX NAME)



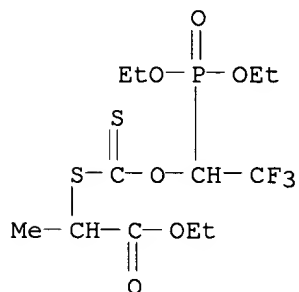
RN 312731-30-9 HCAPLUS

CN Propanoic acid, 2-[[thioxo(2,2,2-trifluoroethoxy)methyl]thio]-, ethyl ester (9CI) (CA INDEX NAME)



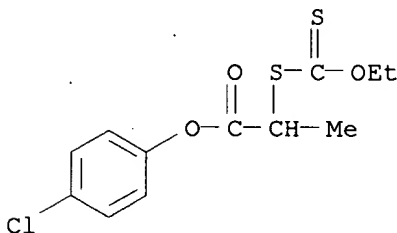
RN 344404-27-9 HCAPLUS

CN 3,6-Dioxa-8-thia-4-phosphadecan-10-oic acid, 4-ethoxy-9-methyl-7-thioxo-5-(trifluoromethyl)-, ethyl ester, 4-oxide (9CI) (CA INDEX NAME)



RN 474418-96-7 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, 4-chlorophenyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 17 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:307259 HCAPLUS

DN 137:79522

TI Preparation of reactive composite latexes by "living" radical polymerization using the RAFT process. A new class of polymer materials

AU Monteiro, Michael J.; De Barbeyrac, Jean

CS Laboratory of Polymer Chemistry (SPC), Eindhoven University of Technology, Eindhoven, 5600 MB, Neth.

SO Macromolecular Rapid Communications (2002), 23(5/6), 370-374

CODEN: MRCOE3; ISSN: 1022-1336

PB Wiley-VCH Verlag GmbH

DT Journal

LA English

CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 35

AB A new class of polymer (nanocomposite) materials of di- and triblock polymers of polystyrene, poly(Bu acrylate) and poly(acetoacetoxyethyl



methacrylate) with a core-shell particle morphol. and a controlled mol. wt. distribution were prep'd. via emulsion **polymn.** in the presence of a reversible addn./fragmentation **chain transfer** (RAFT) agent. The film properties of these blocks are far superior to the conventional blend of the two polymers even after crosslinking with 1,6-hexanediamine.

ST polystyrene polybutyl acrylate polyacetoacetoxyethyl methacrylate block copolymer nanocomposite; emulsion **polymn** polystyrene polybutyl acrylate polyacetoacetoxyethyl methacrylate block copolymer; living **polymn** polystyrene polybutyl acrylate polyacetoacetoxyethyl methacrylate block copolymer

IT **Polymerization**

(emulsion; properties of reactive composite latexes prep'd. by "**living**" **radical polymn.** using reversible addn./fragmentation **chain transfer** process)

IT **Polymerization**

(**living, radical**; properties of reactive composite latexes prep'd. by "**living**" **radical polymn** . using reversible addn./fragmentation **chain transfer** process)

IT **Chain transfer agents**

(prepn. of reactive composite latexes by "**living**" **radical polymn.** using reversible addn./fragmentation **chain transfer** process)

IT Latex

Mechanical loss

Molecular weight distribution

Nanocomposites

Particle size

Stress-strain relationship

(properties of reactive composite latexes prep'd. by "**living**" **radical polymn.** using reversible addn./fragmentation **chain transfer** process)

IT 123972-86-1

RL: RCT (Reactant); RACT (Reactant or reagent)

(**chain transfer** agent; prepn. of reactive composite latexes by "**living**" **radical polymn.** using reversible addn./fragmentation **chain transfer** process)

IT 9003-53-6P, Polystyrene

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(core; prepn. of reactive composite latexes by "**living**" **radical polymn.** using reversible addn./fragmentation **chain transfer** process)

IT 351331-13-0P, 2-Acetoacetoxyethyl methacrylate-butyl acrylate-styrene block copolymer

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(diblock or triblock; prepn. of reactive composite latexes by "**living**" **radical polymn.** using reversible addn./fragmentation **chain transfer** process)

IT 340976-96-7P, Acetoacetoxyethyl methacrylate-butyl acrylate-1,6-hexanediamine-styrene copolymer

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(prepn. of reactive composite latexes by "**living**" **radical polymn.** using reversible addn./fragmentation

**chain transfer process)**

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

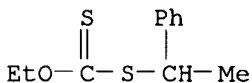
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- (15) Solomon, D; US 4581429 1985 HCAPLUS
- (16) Wang, J; Macromolecules 1995, V28, P7901 HCAPLUS

IT 123972-86-1

RL: RCT (Reactant); RACT (Reactant or reagent)  
(**chain transfer** agent; prepn. of reactive composite  
latexes by "**living**" **radical polymn.** using  
reversible addn./fragmentation **chain transfer**  
process)

RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX  
NAME)



L19 ANSWER 18 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:220661 HCAPLUS

DN 136:263614

TI Method for block polymer synthesis by controlled radical polymerization in  
the presence of a disulfide compound

IN Destarac, Mathias

PA Rhodia Chimie, Fr.

SO PCT Int. Appl., 27 pp.

CODEN: PIXXD2

DT Patent

LA French

IC ICM C08F

CC 35-4 (Chemistry of Synthetic High **Polymers**)

Section cross-reference(s): 23

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002022688	A2	20020321	WO 2001-FR2821	20010911
	WO 2002022688	A3	20020620		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,

LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PH, PL,  
 PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG,  
 US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,  
 DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,  
 BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

FR 2814168 A1 20020322 FR 2000-11877 20000918

AU 2001090009 A5 20020326 AU 2001-90009 20010911

EP 1319027 A2 20030618 EP 2001-969876 20010911

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

BR 2001013941 A 20030722 BR 2001-13941 20010911

NO 2003001231 A 20030519 NO 2003-1231 20030317

PRAI FR 2000-11877 A 20000918

WO 2001-FR2821 W 20010911

AB Polymers, useful in the manuf. of block copolymers, are manufd. by polymn. of ethylenically unsatd. compds. in the presence of compds. having C(S)S or C(S)SS(S)C groups. A typical disulfide was manufd. by reaction of Me chloropropionate 30 min with K xanthate in Me<sub>2</sub>CO.

ST block copolymer manuf disulfide chain transfer agent; propionyl ethyl xanthate chain transfer agent manuf

IT **Chain transfer agents**

(block polymer synthesis by controlled **radical polymn**  
 . in presence of disulfides)

IT Polymers, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(block; block polymer synthesis by controlled **radical polymn**. in presence of disulfides)

IT **Polymerization**

(**radical**; block polymer synthesis by controlled  
**radical polymn**. in presence of disulfides)

IT 9003-32-1P, Polyethyl acrylate 9003-53-6P, Polystyrene

RL: IMF (Industrial manufacture); PREP (Preparation)

(block polymer precursor; block polymer synthesis by controlled  
**radical polymn**. in presence of disulfides)

IT 106608-38-2P, Acrylic acid-vinyl alcohol block copolymer 111740-42-2P,

Methyl acrylate-styrene block copolymer 114397-35-2P, Ethyl

acrylate-styrene block copolymer 127972-36-5P, tert-Butyl

acrylate-styrene block copolymer 135911-78-3P, Butyl acrylate-vinyl

acetate block copolymer 172905-57-6P, Butyl acrylate-ethyl acrylate

block copolymer 189832-80-2P, Butyl acrylate-vinyl alcohol block

copolymer 218966-84-8P, Ethyl acrylate-vinyl acetate block copolymer

218966-85-9P, tert-Butyl acrylate-ethyl acrylate block copolymer

218966-86-0P, tert-Butyl acrylate-vinyl acetate block copolymer

RL: IMF (Industrial manufacture); PREP (Preparation)

(block polymer synthesis by controlled **radical polymn**  
 . in presence of disulfides)

IT 502-55-6P **351491-23-1P 404929-18-6P** 404929-19-7P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(block polymer synthesis by controlled **radical polymn**  
 . in presence of disulfides)

IT 75-89-8 140-89-6, Potassium xanthate 535-11-5, Ethyl 2-bromopropionate

17639-93-9, Methyl 2-chloropropionate 60564-16-1

RL: RCT (Reactant); RACT (Reactant or reagent)

(**chain-transfer** agent precursor; block polymer  
 synthesis by controlled **radical polymn**. in presence  
 of disulfides)

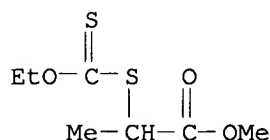
IT 351491-23-1P 404929-18-6P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(block polymer synthesis by controlled **radical polymn** . in presence of disulfides)

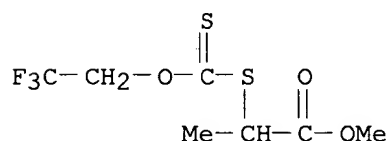
RN 351491-23-1 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, methyl ester (9CI) (CA INDEX NAME)



RN 404929-18-6 HCAPLUS

CN Propanoic acid, 2-[[thioxo(2,2,2-trifluoroethoxy)methyl]thio]-, methyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 19 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:95203 HCAPLUS

DN 136:325905

TI Direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via the MADIX process

AU Taton, Daniel; Wilczewska, Agnieszka-Zofia; Destarac, Mathias

CS RHODIA, Centre de Recherches d'Aubervilliers, Aubervilliers, 93 308, Fr.

SO Macromolecular Rapid Communications (2001), 22(18), 1497-1503

CODEN: MRCOE3; ISSN: 1022-1336

PB Wiley-VCH Verlag GmbH

DT Journal

LA English

CC 35-4 (Chemistry of Synthetic High **Polymers**)

AB Double hydrophilic statistical, di- and triblock copolymers comprising acrylamide and acrylic acid units are prepd. in aq. media by starting from either a mono- or difunctional xanthate. The resulting AB- and ABA- type double hydrophilic block copolymers show molar masses predetd. by the initial molar ratio of the monomers to the xanthate precursor and polydispersities of up to 1.5. Batch copolymn. yields well-defined statistical copolymers that can be chain-extended to provide the basis of new poly(acrylic acid-co-acrylamide)-block-polyacrylamide.

ST hydrophilic acrylamide acrylic acid block copolymer; MADIX **polymn** acrylic acid acrylamide block copolymer; xanthate **chain transfer** acrylic block copolymn

IT Polymerization

(MADIX; direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via

- MADIX process)
- IT Hydrophilicity  
Polymerization catalysts  
(direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via MADIX process)
- IT Chain transfer agents  
(xanthates; direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via MADIX process)
- IT **351491-23-1 412907-16-5**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**chain-transfer** agent; direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via MADIX process)
- IT 121236-26-8P, Acrylamide-acrylic acid block copolymer  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(di- and triblock; direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via MADIX process)
- IT 2638-94-0, 4,4'-Azobis(4-cyanopentanoic acid)  
RL: CAT (Catalyst use); USES (Uses)  
(direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via MADIX process)
- IT 9003-01-4P, Acrylic acid homopolymer 9003-05-8P, Acrylamide homopolymer  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via MADIX process)
- IT 107-21-1, Ethylene glycol, reactions 140-89-6, Potassium ethyl xanthate  
563-76-8, 2-Bromopropionyl bromide  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(in xanthate prepn.; direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via MADIX process)
- IT 5468-93-9P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(in xanthate prepn.; direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via MADIX process)
- RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD

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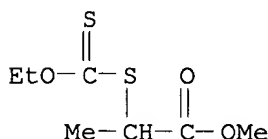
IT 351491-23-1 412907-16-5

RL: RCT (Reactant); RACT (Reactant or reagent)

(**chain-transfer** agent; direct synthesis of double hydrophilic statistical di- and triblock copolymers comprised of acrylamide and acrylic acid units via MADIX process)

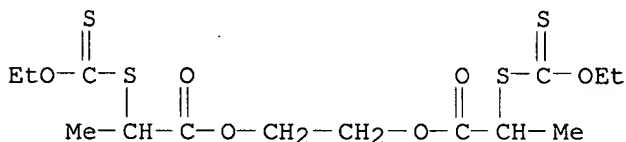
RN 351491-23-1 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, methyl ester (9CI) (CA INDEX NAME)



RN 412907-16-5 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, 1,2-ethanediyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 20 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:90125 HCAPLUS

DN 136:135203

TI Method for synthesis of hybrid silicone and organic copolymer by controlled free radical polymerization

IN Destarac, Mathias; Mignani, Gerard; Zard, Samir; Sire, Beatrice; Kalai, Chakib

PA Rhodia Chimie, Fr.

SO PCT Int. Appl., 33 pp.

CODEN: PIXXD2

DT Patent

LA French

IC ICM C08G002-38

ICS C08F293-00; C08G077-28; C08G077-392; C08F283-12

CC 35-8 (Chemistry of Synthetic High **Polymers**)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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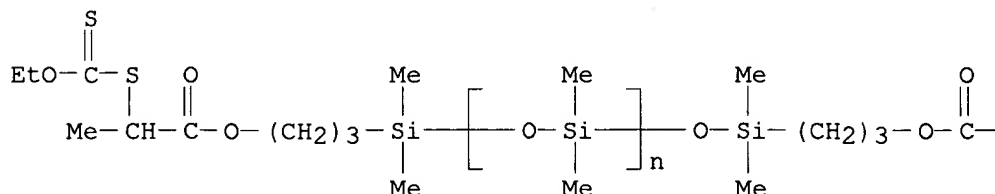
PI WO 2002008307 A1 20020131 WO 2001-FR2433 20010725  
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 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG  
 FR 2812296 A1 20020201 FR 2000-9722 20000725  
 FR 2812296 B1 20021220  
 EP 1309638 A1 20030514 EP 2001-956640 20010725  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR  
 PRAI FR 2000-9722 A 20000725  
 WO 2001-FR2433 W 20010725  
 AB Title copolymers are manufd. by radical polymn. of unsatd. monomers in the presence of polysiloxanes having xanthate groups. A typical polysiloxane having xanthate groups was manufd. by dropwise addn. of 1.9 mL 2-bromopropionyl chloride to ether contg. 10 g HO(C3H6)SiMe2O(SiMe2O)13SiMe2(C3H6)OH and reaction of 2.22 g K Et xanthate 4 h with 5 g resulting intermediate.  
 ST hybrid silicone org copolymer manuf; xanthate contg silicone unsatd compd radical polymn  
 IT Polysiloxanes, preparation  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (acrylic, block; synthesis of hybrid silicone and org. copolymer by controlled free **radical polymn.**)  
 IT Polysiloxanes, reactions  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (xanthate group-contg.; synthesis of hybrid silicone and org. copolymer by controlled free **radical polymn.**)  
 IT 140-89-6, Potassium ethyl xanthate 563-76-8, 2-Bromopropionyl bromide  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (precursor; synthesis of hybrid silicone and org. copolymer by controlled free **radical polymn.**)  
 IT 31900-57-9D, Dimethylsilanediol homopolymer, hydroxypropyldimethylsilyl-terminated, xanthate derivs. **392658-24-1** 393515-92-9D, trimethylsilyl-terminated, xanthate derivs.  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (synthesis of hybrid silicone and org. copolymer by controlled free **radical polymn.**)  
 IT 211255-22-0P, Dimethylsilanediol-ethyl acrylate block copolymer 393516-51-3P, Dimethylsilanediol-vinyl acetate block copolymer  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (synthesis of hybrid silicone and org. copolymer by controlled free **radical polymn.**)  
 RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE  
 (1) Charmot, D; WO 9858974 A 1998 HCAPLUS  
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 (4) Singer, H; FASERFORSCHUNG UND TEXTILTECHNIK V28(9), P435 HCAPLUS  
 IT **392658-24-1**  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical

process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (synthesis of hybrid silicone and org. copolymer by controlled free  
**radical polymn.**)

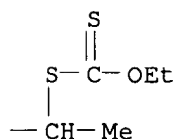
RN 392658-24-1 HCAPLUS

CN Poly[oxy(dimethylsilylene)], .alpha.-(1,1,7-trimethyl-6-oxo-9-thioxo-5,10-dioxa-8-thia-1-siladodec-1-yl)-.omega.-[(1,1,7-trimethyl-6-oxo-9-thioxo-5,10-dioxa-8-thia-1-siladodec-1-yl)oxy]- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



L19 ANSWER 21 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:73523 HCAPLUS

DN 136:355549

TI Thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s

AU Mitchell, William J.; Pena, Christophe; Burn, Paul L.

CS The Dyson Perrins Laboratory, University of Oxford, Oxford, OX1 3QY, UK

SO Journal of Materials Chemistry (2002), 12(2), 200-205

CODEN: JMACEP; ISSN: 0959-9428

PB Royal Society of Chemistry

DT Journal

LA English

CC 35-5 (Chemistry of Synthetic High **Polymers**)

Section cross-reference(s): 73

AB We have prepd. poly(2,5-dimethoxy-1,4-phenylenevinylene) (DMEOPPV) and poly(2,5-thienylene vinylene) (PTV) via xanthate precursor polymer routes. The resp. precursor polymers can be thermally converted to their corresponding conjugated polymers without the need for acid catalysis. For both DMEOPPV and PTV the UV-visible absorption and IR spectra were similar to the polymers when prepd. via alkoxy precursors. Films of DMEOPPV and blends of DMEOPPV and PPV were found to be luminescent with energy being transferred from the PPV host to the DMEOPPV guest. Films of PTV or PTV-PPV blends were found not to be luminescent.

ST polyphenylenevinylene polythiophenylenevinylene synthesis blend photoluminescence HOMO LUMO energy gap

IT LUMO (molecular orbital)

(HOMO gap; thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)

IT HOMO (molecular orbital)

(LUMO gap; thermal routes to low HOMO-LUMO energy gap poly(arylene



- vinylene)s)
- IT Polymers, preparation  
RL: POF (Polymer in formulation); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(conjugated; thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- IT Luminescence  
(thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- IT Poly(arylenealkenylene)s  
RL: POF (Polymer in formulation); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- IT Polymer blends  
RL: PRP (Properties)  
(thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- IT Polythiophenylenes  
RL: POF (Polymer in formulation); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(vinylene group-contg.; thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- IT 3752-97-4, 1,4-Bis(chloromethyl)-2,5-dimethoxybenzene 28569-48-4, 2,5-Bis(chloromethyl)thiophene  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(monomer synthesis; thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- IT **420842-61-1P 420842-66-6P**  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(monomer; thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- IT 865-47-4  
RL: CAT (Catalyst use); USES (Uses)  
(**polymn.** catalyst, atom transfer **radical**; thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- IT **420842-63-3P 420842-70-2P 420842-77-9P 420842-85-9P**  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(precursor polymer; thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- IT 25190-54-9P 26498-02-2P, Poly(2,5-thiophenediyl-1,2-ethenediyl) **420842-63-3DP**, thermally converted **420842-70-2DP**, thermally converted  
RL: POF (Polymer in formulation); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- IT 140-89-6  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)
- RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD
- RE
- (1) Becker, H; Adv Mater 2000, V12, P42 HCAPLUS
  - (2) Becker, H; Macromolecules 1999, V32, P4925 HCAPLUS
  - (3) Becker, H; Synth Met 2000, V111, P145
  - (4) Boardman, F; Macromolecules 1999, V32, P111 HCAPLUS
  - (5) Burn, P; Adv Mater 1997, V9(15), P1171 HCAPLUS
  - (6) Burn, P; J Chem Soc, Perkin Trans 1 1992, P3225 HCAPLUS
  - (7) Burn, P; J Mater Chem 1996, V6, P1253

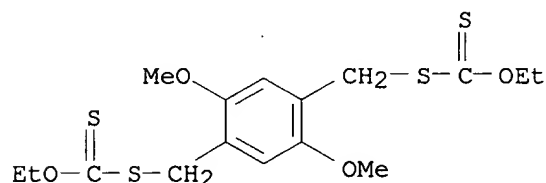
- (8) Hsieh, B; Adv Mater 1995, V7, P36 HCAPLUS
- (9) Kraft, A; Angew Chem, Int Ed 1998, V37, P402
- (10) Lo, S; J Mater Chem 1999, V9, P2165 HCAPLUS
- (11) Lo, S; J Mater Chem 2000, V10, P275 HCAPLUS
- (12) Lo, S; J Mater Chem 2001, V11, P2228 HCAPLUS
- (13) Louwet, F; Macromolecules 1995, V28, P1330 HCAPLUS
- (14) Momii, T; Chem. Lett 1988, P1201 HCAPLUS
- (15) Murata, H; Synth Met 1990, V36, P95 HCAPLUS
- (16) Sakamoto, K; Bull Chem Soc Jpn 1975, V48, P497 HCAPLUS
- (17) Son, S; Science 1995, V269, P376 HCAPLUS
- (18) Swatos, W; Polym Prepr 1990, V31, P505 HCAPLUS
- (19) Takeshita, M; J Org Chem 1991, V56, P2837 HCAPLUS
- (20) Tokito, S; Polymer 1990, V31, P1137 HCAPLUS
- (21) Tokito, S; Polymer 1991, V32, P465
- (22) Wessling, R; J Polym Sci, Polym Symp 1985, V72, P55 HCAPLUS
- (23) Woo, H; Phys Rev B 1992, V46, P7379 HCAPLUS
- (24) Yamada, S; J Chem Soc, Chem Commun 1987, P1148

IT 420842-61-1P 420842-66-6P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(monomer; thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)

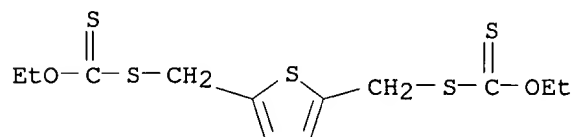
RN 420842-61-1 HCAPLUS

CN Carbonodithioic acid, S,S'-[(2,5-dimethoxy-1,4-phenylene)bis(methylene)] O,O'-diethyl ester (9CI) (CA INDEX NAME)



RN 420842-66-6 HCAPLUS

CN Carbonodithioic acid, S,S'-[2,5-thiophenediylbis(methylene)] O,O'-diethyl ester (9CI) (CA INDEX NAME)



IT 420842-63-3P 420842-70-2P 420842-77-9P

420842-85-9P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(precursor polymer; thermal routes to low HOMO-LUMO energy gap poly(arylene.vinylene)s)

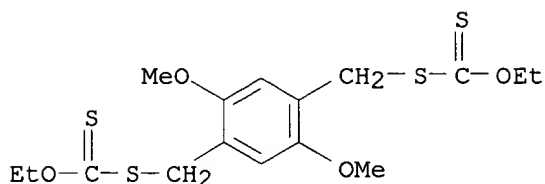
RN 420842-63-3 HCAPLUS

CN Carbonodithioic acid, S,S'-[(2,5-dimethoxy-1,4-phenylene)bis(methylene)] O,O'-diethyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 420842-61-1

CMF C16 H22 O4 S4



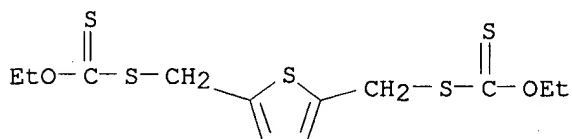
RN 420842-70-2 HCAPLUS

CN Carbonodithioic acid, S,S'-[2,5-thiophenediylbis(methylene)] O,O'-diethyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

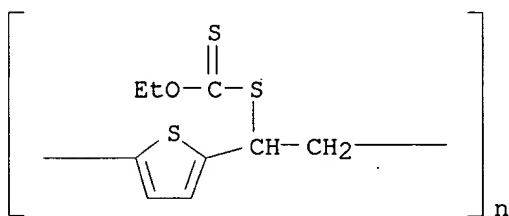
CRN 420842-66-6

CMF C12 H16 O2 S5



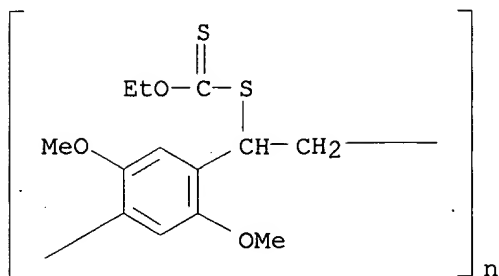
RN 420842-77-9 HCAPLUS

CN Poly[2,5-thiophenediyl[1-[(ethoxythioxomethyl)thio]-1,2-ethanediyl]] (9CI) (CA INDEX NAME)



RN 420842-85-9 HCAPLUS

CN Poly[(2,5-dimethoxy-1,4-phenylene)[1-[(ethoxythioxomethyl)thio]-1,2-ethanediyl]] (9CI) (CA INDEX NAME)



IT 420842-63-3DP, thermally converted 420842-70-2DP,  
thermally converted  
RL: POF (Polymer in formulation); PRP (Properties); SPN (Synthetic  
preparation); PREP (Preparation); USES (Uses)  
(thermal routes to low HOMO-LUMO energy gap poly(arylene vinylene)s)

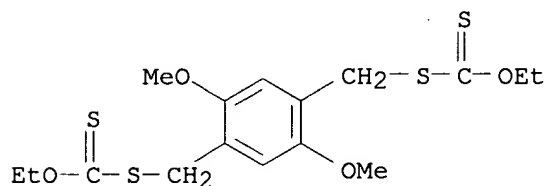
RN 420842-63-3 HCAPLUS

CN Carbonodithioic acid, S,S'-[(2,5-dimethoxy-1,4-phenylene)bis(methylene)]  
O,O'-diethyl ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 420842-61-1

CMF C16 H22 O4 S4



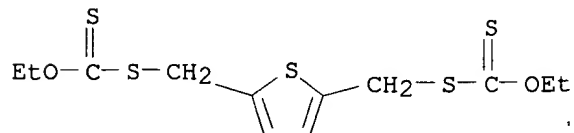
RN 420842-70-2 HCAPLUS

CN Carbonodithioic acid, S,S'-[2,5-thiophenediylbis(methylene)] O,O'-diethyl  
ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 420842-66-6

CMF C12 H16 O2 S5



L19 ANSWER 22 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:463752 HCAPLUS

DN 135:195878

- TI Controlled Radical Polymerization of Acrylic Acid in Protic Media  
 AU Ladaviere, Catherine; Doerr, Nicole; Claverie, Jerome P.  
 CS LCPP CPE/CNRS 43, Villeurbanne, 69616, Fr.  
 SO Macromolecules (2001), 34(16), 5370-5372  
 CODEN: MAMOBX; ISSN: 0024-9297  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-4 (Chemistry of Synthetic High **Polymers**)  
 AB Various dithio esters were prepd. and screened for their suitability as **chain transfer** agents in the title **polymn.**  
 ST dithiocarboxylate **chain transfer** agent acrylic acid  
 controlled radical **polymn**  
 IT **Chain transfer** agents  
 (controlled **radical polymn.** of acrylic acid in  
 protic media using dithio compds. as **chain transfer**  
 agents)  
 IT Carboxylic acids, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (dithiocarboxylic, **chain transfer** agents;  
 controlled **radical polymn.** of acrylic acid in  
 protic media using dithio compds. as **chain transfer**  
 agents)  
 IT 109-86-4, 2-Methoxyethanol 112-35-6 121-68-6, Benzenecarbodithioic  
 acid 1005-56-7, Phenyl chlorothionoformate 6263-65-6 29263-94-3,  
 Diethyl 2-bromo-2-methylmalonate 29364-29-2, Sodium 2-methyl-2-  
 propanethiolate 65944-33-4 357268-68-9  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (**chain transfer** agent synthesis; controlled  
**radical polymn.** of acrylic acid in protic media using  
 dithio compds. as **chain transfer** agents)  
 IT 26504-29-0 **123972-86-1 357268-50-9**  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (**chain transfer** agent; controlled **radical**  
**polymn.** of acrylic acid in protic media using dithio compds. as  
**chain transfer** agents)  
 IT 942-91-6P **2943-26-2P** 5925-55-3P **24472-74-0P**  
 27249-90-7P 37912-25-7P 227205-60-9P 259195-14-7P 357268-45-2P  
**357268-52-1P 357268-53-2P 357268-55-4P**  
**357268-59-8P 357268-62-3P**  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (**chain transfer** agent; controlled **radical**  
**polymn.** of acrylic acid in protic media using dithio compds. as  
**chain transfer** agents)  
 IT 2638-94-0, V 501 9003-01-4, Polyacrylic acid  
 RL: CAT (Catalyst use); USES (Uses)  
 (controlled **radical polymn.** of acrylic acid in  
 protic media using dithio compds. as **chain transfer**  
 agents)  
 IT 100-39-0, Benzyl bromide 140-89-6, Potassium O-ethyl dithiocarbonate  
 3575-19-7 6160-65-2, Thiocarbonyl diimidazole  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (controlled **radical polymn.** of acrylic acid in  
 protic media using dithio compds. as **chain transfer**  
 agents)  
 IT 128-37-0, BHT, uses 135-20-6, Cupferron  
 RL: CAT (Catalyst use); USES (Uses)

(**polymn.** inhibitor; controlled **radical**  
**polymn.** of acrylic acid in protic media using dithio compds. as  
**chain transfer** agents)

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

- (1) Benoit, D; J Am Chem Soc 1999, V121, P3904 HCAPLUS
- (2) Bonnet, C; FR 2655875 1991 HCAPLUS
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- (5) Chiefari, J; Macromolecules 1999, V32, P7700 HCAPLUS
- (6) Chong, B; Macromolecules 1999, V32, P2071
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- (9) Hawthorne, D; Macromolecules 1999, V32, P5457 HCAPLUS
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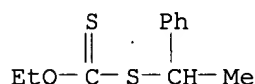
IT 123972-86-1 357268-50-9

RL: RCT (Reactant); RACT (Reactant or reagent)

(**chain transfer** agent; controlled **radical**  
**polymn.** of acrylic acid in protic media using dithio compds. as  
**chain transfer** agents)

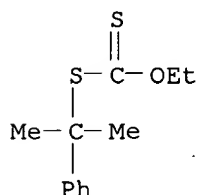
RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



RN 357268-50-9 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-methyl-1-phenylethyl) ester (9CI) (CA INDEX NAME)



IT 2943-26-2P 24472-74-0P 357268-52-1P  
 357268-53-2P 357268-55-4P 357268-59-8P  
 357268-62-3P

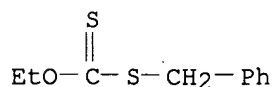
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)

(**chain transfer** agent; controlled **radical**)

**polymn.** of acrylic acid in protic media using dithio compds. as  
**chain transfer agents)**

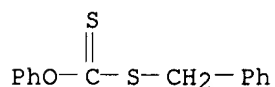
RN 2943-26-2 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



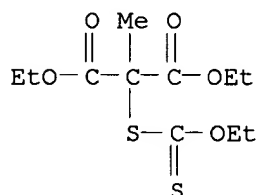
RN 24472-74-0 HCAPLUS

CN Carbonodithioic acid, O-phenyl S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



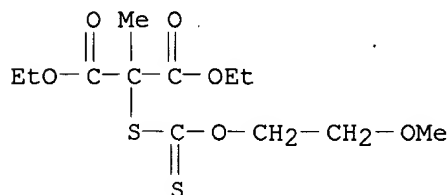
RN 357268-52-1 HCAPLUS

CN Propanedioic acid, [(ethoxythioxomethyl)thio]methyl-, diethyl ester (9CI) (CA INDEX NAME)



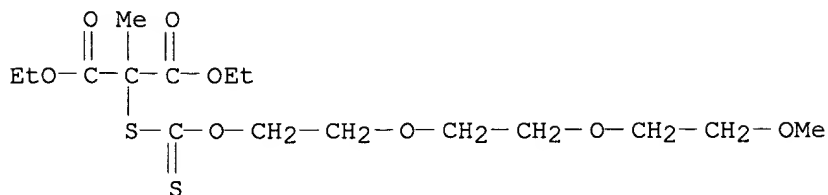
RN 357268-53-2 HCAPLUS

CN Propanedioic acid, [[(2-methoxyethoxy)thioxomethyl]thio]methyl-, diethyl ester (9CI) (CA INDEX NAME)

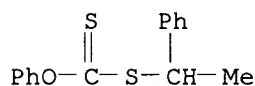


RN 357268-55-4 HCAPLUS

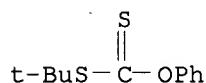
CN Propanedioic acid, methyl[(1-thioxo-2,5,8,11-tetraoxadodec-1-yl)thio]-, diethyl ester (9CI) (CA INDEX NAME)



RN 357268-59-8 HCAPLUS  
 CN Carbonodithioic acid, O-phenyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



RN 357268-62-3 HCAPLUS  
 CN Carbonodithioic acid, S-(1,1-dimethylethyl) O-phenyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 23 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:435149 HCAPLUS  
 DN 135:46645  
 TI Surface chemistry modified latex and redispersible powders, production and use thereof  
 IN Bett, William; Castaing, Jean-christophe; D'allest, Jean-francois  
 PA Rhodia Chimie, Fr.  
 SO PCT Int. Appl., 41 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA French  
 IC ICM C08F293-00  
 CC 35-4 (Chemistry of Synthetic High **Polymers**)  
 Section cross-reference(s): 38, 42, 58

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001042325	A1	20010614	WO 2000-FR3454	20001208
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				



FR 2802209	A1	20010615	FR 1999-15714	19991210
FR 2802209	B1	20020301		
EP 1242492	A1	20020925	EP 2000-990042	20001208

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

US 2003114548	A1	20030619	US 2002-149018	20020604
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PRAI FR 1999-15714	A	19991210
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WO 2000-FR3454	W	20001208
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AB The invention relates to a surface chem. modified latex which can be obtained by carrying out radical polymn. in emulsion in the presence of at least one ethylenically unsatd. monomer or at least one polymer having ethylenically unsatd. bonds, at least one radical polymn. initiator, and at least one of a homopolymer or a di- or triblock copolymer which is sol. or dispersible in water, comprising an active group at the end thereof, capable of forming a radical, and chosen from dithioesters, xanthates, thioether-thiones and dithiocarbamates. The invention also relates to redispersible powders obtained by drying said latexes without using a high content of drying auxiliaries. These powders are useful in paints, adhesives, paper manuf., and construction materials. A typical latex was manufd. by emulsion-polymn., in the presence of 0.17 g of Na<sub>2</sub>S<sub>2</sub>O<sub>8</sub> at 80-85.degree., of 20 g emulsion prepd. from 47.5 g water, 79.7 g mixt. contg. 60.1% Bu acrylate and 36.9% styrene, and 2.6 g polymer prepd. by radical polymn. of 63.36 g acrylic acid in the presence of 16.64 g methylisopropyl O-ethylxanthate.

ST redispersible polymer powder manuf dithioester polymer deriv additive; polyacrylic xanthate deriv additive redispersible polymer powder manuf; butyl acrylate styrene copolymer powder redispersible; paper manuf redispersible polymer powder; construction material redispersible polymer powder; adhesive redispersible polymer powder; paint redispersible polymer powder; dithiocarbamate polymer deriv additive redispersible polymer powder manuf; thioether thione polymer deriv additive redispersible polymer powder manuf; xanthate polymer deriv additive redispersible polymer powder manuf

IT Powders

(surface chem. modified latexes manufd. by **radical polymn.** in presence of polymers having sulfur-contg. end groups for redispersible powders)

IT Adhesives

(surface chem. modified latexes manufd. by **radical polymn.** in presence of polymers having sulfur-contg. end groups for redispersible powders for adhesives)

IT Construction materials

(surface chem. modified latexes manufd. by **radical polymn.** in presence of polymers having sulfur-contg. end groups for redispersible powders for construction materials)

IT Paints

(surface chem. modified latexes manufd. by **radical polymn.** in presence of polymers having sulfur-contg. end groups for redispersible powders for paints)

IT Paper

(surface chem. modified latexes manufd. by **radical polymn.** in presence of polymers having sulfur-contg. end groups for redispersible powders for paper manuf.)

IT 9003-01-4DP, Polyacrylic acid, reaction products with methylisopropyl ethylxanthate 9003-05-8DP, Polyacrylamide, reaction products with methylisopropyl ethylxanthate **84380-38-1DP**, reaction products with polymers 121917-48-4DP, Acrylic acid-butyl acrylate block copolymer, reaction products with methylisopropyl ethylxanthate

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(surface chem. modified latexes manufd. by **radical polymn.** in presence of polymers having sulfur-contg. end groups for redispersible powders)

IT 131830-42-7P, Acrylic acid-butyl acrylate-styrene block copolymer  
344424-37-9P 344424-38-0P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(surface chem. modified latexes manufd. by **radical polymn.** in presence of polymers having sulfur-contg. end groups for redispersible powders)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

(1) Charmot, D; WO 9858974 A 1998 HCAPLUS

(2) Mitsubishi; EP 0296850 A 1988 HCAPLUS

(3) Otsu, T; US 5314962 A 1994 HCAPLUS

(4) Tosoh Corp; EP 0421149 A 1991 HCAPLUS

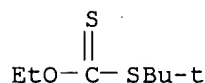
IT **84380-38-1DP**, reaction products with polymers

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(surface chem. modified latexes manufd. by **radical polymn.** in presence of polymers having sulfur-contg. end groups for redispersible powders)

RN 84380-38-1 HCAPLUS

CN Carbonodithioic acid, S-(1,1-dimethylethyl) O-ethyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 24 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2001:435137 HCAPLUS

DN 135:46644

TI Synthesis method for polymers by controlled radical polymerization with xanthates

IN Destarac, Mathias; Charmot, Dominique; Zard, Samir; Gauthier-Gillaizeau, Isabelle

PA Rhodia Chimie, Fr.

SO PCT Int. Appl., 46 pp.

CODEN: PIXXD2

DT Patent

LA French

IC ICM C08F002-38

ICS C08F293-00; C07F009-40

CC 35-4 (Chemistry of Synthetic High **Polymers**)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2001042312	A1	20010614	WO 2000-FR3458	20001208
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,				

SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN,  
 YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, UG, ZW, AT, BE, CH, CY,  
 DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,  
 BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

FR 2802208 A1 20010615 FR 1999-15555 19991209

FR 2802208 B1 20030214

EP 1242467 A1 20020925 EP 2000-990045 20001208

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

US 2003045661 A1 20030306 US 2002-149063 20020607

PRAI FR 1999-15555 A 19991209

WO 2000-FR3458 W 20001208

OS MARPAT 135:46644

AB Xanthates having phosphonate ester groups bonded to the O by a C preferably attached to an electron-attracting group are useful in controlling free-radical polymn. of unsatd. compds. A typical xanthate was manufd. by mixing 64.6 mmol fluoral hydrate 15 h with 64.6 mmol di-Et phosphite in 64.6 mmol Et3N and adding a DMF soln. of the resulting di-Et 2,2,2-trifluoro-1-hydroxyethylphosphonate (21.18 mmol) dropwise to DMF contg. 25.75 mmol NaH at 0.degree., mixing 30 min at 0.degree., adding 44 mmol CS2, mixing 15 min, adding 26.7 mmol Et 2-propionate, and mixing 23 h at 0.degree..

ST phosphonate ester group contg xanthate **chain transfer**  
 agent manuf; unsatd compd radical **polymn chain**  
**transfer** agent xanthate

IT Halides

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (org., xanthate precursor; synthesis of polymers by controlled  
**radical polymn.** with xanthates having phosphonate  
 ester groups)

IT **Polymerization**

(**radical**; synthesis of polymers by controlled **radical**  
**polymn.** with xanthates having phosphonate ester groups)

IT **Chain transfer** agents

(synthesis of polymers by controlled **radical polymn**  
 . with xanthates having phosphonate ester groups)

IT Carbonyl compounds (organic), reactions

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (xanthate precursor; synthesis of polymers by controlled  
**radical polymn.** with xanthates having phosphonate  
 ester groups)

IT 9003-17-2P, Polybutadiene 9003-20-7P, Polyvinyl acetate 9003-32-1P,  
 Polyethyl acrylate 9003-53-6P, Polystyrene 9010-98-4P, Polychloroprene  
 25035-84-1P, Polyvinyl propionate 111740-42-2P, Methyl acrylate-styrene  
 block copolymer 114397-35-2P, Ethyl acrylate-styrene block copolymer  
 127972-36-5P, tert-Butyl acrylate-styrene block copolymer 135911-78-3P,  
 Butyl acrylate-vinyl acetate block copolymer 218966-84-8P, Ethyl  
 acrylate-vinyl acetate block copolymer 218966-86-0P, tert-Butyl  
 acrylate-vinyl acetate block copolymer

RL: IMF (Industrial manufacture); PREP (Preparation)  
 (synthesis of polymers by controlled **radical polymn**  
 . with xanthates having phosphonate ester groups)

IT **344404-27-9P 344404-28-0P**

RL: IMF (Industrial manufacture); TEM (Technical or engineered material  
 use); PREP (Preparation); USES (Uses)

(synthesis of polymers by controlled **radical polymn**  
 . with xanthates having phosphonate ester groups)

IT 156748-67-3P  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (xanthate precursor; synthesis of polymers by controlled **radical polymn.** with xanthates having phosphonate ester groups)

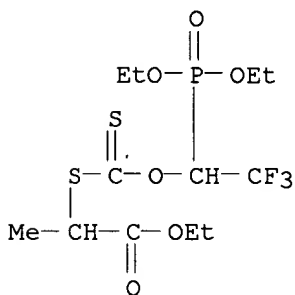
IT 75-07-0, Acetaldehyde, reactions 75-15-0, Carbon disulfide, reactions 421-53-4, Fluoral hydrate 535-11-5, Ethyl 2-bromopropionate 762-04-9, Diethyl phosphite  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (xanthate precursor; synthesis of polymers by controlled **radical polymn.** with xanthates having phosphonate ester groups)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

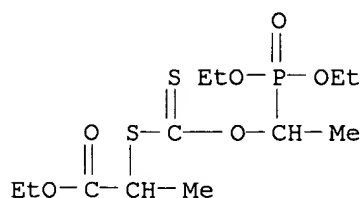
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- (2) Burke, T; J Med Chem 1991, V34(5), P1577 HCAPLUS
- (3) Burke, T; J Org Chem 1993, V58(6), P1336 HCAPLUS
- (4) Franck, X; WO 0075207 A 2000 HCAPLUS
- (5) Hatanaka, T; US 3901932 A 1975 HCAPLUS
- (6) Le Tam Phuong; WO 9801478 A 1998 HCAPLUS
- (7) Rhone Poulenc Chimie; FR 2764892 A 1998 HCAPLUS
- (8) Sakai Chemical Industry Co, Ltd; JP 50111106 A 1975 HCAPLUS
- (9) Tada, F; STN Database accession no 84:92587

IT **344404-27-9P 344404-28-0P**  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (synthesis of polymers by controlled **radical polymn.** with xanthates having phosphonate ester groups)

RN 344404-27-9 HCAPLUS  
 CN 3,6-Dioxa-8-thia-4-phosphadecan-10-oic acid, 4-ethoxy-9-methyl-7-thioxo-5-(trifluoromethyl)-, ethyl ester, 4-oxide (9CI) (CA INDEX NAME)



RN 344404-28-0 HCAPLUS  
 CN 3,6-Dioxa-8-thia-4-phosphadecan-10-oic acid, 4-ethoxy-5,9-dimethyl-7-thioxo-, ethyl ester, 4-oxide (9CI) (CA INDEX NAME)



- L19 ANSWER 25 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:381136 HCAPLUS  
 DN 135:122832  
 TI Free-Radical **Polymerization** of Styrene in Emulsion Using a Reversible Addition-Fragmentation **Chain Transfer** Agent with a Low **Transfer** Constant: Effect on Rate, Particle Size, and Molecular Weight  
 AU Monteiro, Michael J.; de Barbeyrac, Jean  
 CS Laboratory of Polymer Chemistry (SPC), Eindhoven University of Technology, Eindhoven, 5600 MB, Neth.  
 SO Macromolecules (2001), 34(13), 4416-4423  
 CODEN: MAMOBX; ISSN: 0024-9297  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-4 (Chemistry of Synthetic High **Polymers**)  
 AB The ab initio emulsion polymns. of styrene in the presence of RAFT agent (1-(O-ethylxanthyl)ethylbenzene; 1) with a low **chain transfer** const. to styrene (Ctr .apprx. 0.8) were carried out using conventional surfactant (sodium dodecyl sulfate, SDS) and initiator (sodium persulfate, SPS). The influence of varying the concns. of SDS, SPS, and 1 on the **polymn.** rate, particle size distribution, and mol. wt. distribution were studied. It was found that with an increased concn. of SDS both the av.-no. particle size decreased and the particle size distribution became narrower, prescribed to be due to a greater no. of micelles that are nucleated during interval I. A similar result was also found when the concns. of 1 increased. It was postulated that R.bul., produced from the fragmentation of 1, exited particles and reentered micelles, thus creating more particles. At high initiator concns., reentry of R.bul. should not play a dominant role due to the high amt. of aq. phase termination. The rate was also influenced by the concns. of SDS, SPS, and 1. An increase in the concn. of 1 at a low initiator concn. and at const. SDS concn. resulted in significant retardation in rate, which is prescribed to be due to exit and reentry to terminate radicals already growing in the particles. The rate has been shown to increase by increasing the concn. of SDS. For all polymns., the no.-av. mol. wt. (.hivin.Mn) is approx. twice as high compared to theor. calcns. A tentative explanation put forth is that the RAFT agent could be surface active, and therefore the local concn. surrounding the growing radical chains in the particles will be less than the global concn. Block copolymers of poly(styrene-co-Bu acrylate)-acetoacetoxyethyl methacrylate were then synthesized in a second stage **polymn.** under starved feed conditions to give a core-shell morphol. with a very low gel content (.apprx.3%), in which 76.5% of the polystyrene dormant species were converted to blocks.  
 ST **chain transfer** agent effect radical emulsion  
**polymn** styrene; polystyrene particle size mol wt distribution

**chain transfer agent**

IT **Chain transfer agents**  
Molecular weight distribution  
Particle size  
Polymer morphology  
Surfactants  
(**polymn.** rate, particle size, and mol. wt. of polystyrene as affected by reversible addn.-fragmentation **chain transfer agent**)

IT 151-21-3, Sodium dodecyl sulfate, uses **123972-86-1**  
RL: NUU (Other use, unclassified); USES (Uses)  
(**polymn.** rate, particle size, and mol. wt. of polystyrene as affected by reversible addn.-fragmentation **chain transfer agent**)

IT 351331-13-0  
RL: PRP (Properties)  
(**polymn.** rate, particle size, and mol. wt. of polystyrene as affected by reversible addn.-fragmentation **chain transfer agent**)

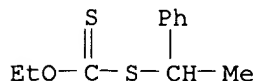
IT 9003-53-6P, Polystyrene  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(**polymn.** rate, particle size, and mol. wt. of polystyrene as affected by reversible addn.-fragmentation **chain transfer agent**)

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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- (2) Chiefari, J; Macromolecules 1998, V31, P5559 HCAPLUS
- (3) Christie, D; Macromol Chem Phys 1996, V197, P403 HCAPLUS
- (4) de Brouwer, H; Macromolecules 2000, V33, P9239 HCAPLUS
- (5) Fischer, H; Factors Controlling the Addition of Carbon-Centered Radicals to Alkenes and Alkynes Copy in File 1997, P63 HCAPLUS
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- (9) Gilbert, R; Trends Polym Sci 1995, V3, P222 HCAPLUS
- (10) Hodgson, M; Thesis, University of Stellenbosh 2000
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- (12) Lansalot, M; Macromolecules 1999, V32, P7354 HCAPLUS
- (13) Le, T; WO 9801478 1998 HCAPLUS
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- (20) Morrison, B; J Polym Sci, Part A: Polym Chem 1994, V32, P631 HCAPLUS
- (21) Morrison, B; Macromol Symp 1995, V92, P13 HCAPLUS
- (22) Muller, A; Macromolecules 1995, V28, P4326
- (23) Nomura, M; J Appl Polym Sci 1994, V51, P21 HCAPLUS
- (24) Smulders, W; Submitted to Macromolecules
- (25) Uzulina, I; Macromol Symp 2000, V150, P33 HCAPLUS

IT **123972-86-1**  
RL: NUU (Other use, unclassified); USES (Uses)  
(**polymn.** rate, particle size, and mol. wt. of polystyrene as affected by reversible addn.-fragmentation **chain transfer agent**)

RN 123972-86-1 HCAPLUS  
 CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



L19 ANSWER 26 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2000:881215 HCAPLUS  
 DN 134:42600  
 TI Synthesis of block copolymers by controlled living radical  
**polymerization** using halogenated xanthates as **chain**  
**transfer** agents  
 IN Destarac, Mathias; Charmot, Dominique; Zard, Samir Z.; Franck, Xavier  
 PA Rhodia Chimie, Fr.  
 SO PCT Int. Appl., 33 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA French  
 IC ICM C08F293-00  
 ICS C08F002-38  
 CC 35-4 (Chemistry of Synthetic High **Polymers**)  
 Section cross-reference(s): 28

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000075207	A1	20001214	WO 2000-FR1438	20000526
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG FR 2794463 A1 20001208 FR 1999-7096 19990604 EP 1185570 A1 20020313 EP 2000-938854 20000526 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO JP 2003501528 T2 20030114 JP 2001-502487 20000526 PRAI <u>FR 1999-7096</u> A 19990604 <u>WO 2000-FR1438</u> W 20000526				

AB The multiblock copolymers are prepd. by reaction of unsatd. monomer in the presence of a free radical initiator and an alkyl, cycloalkyl, aryl, or heterocyclic, halide-substituted (Cl, Br) xanthate as **chain transfer** agent. Controlled radical **polymn.** of Et acrylate was carried out in the presence of (O-2,2,2-trifluoroethylxanthyl) Et propionate and AIBN radical initiator after freeze-vacuum- thaw cycles to remove gases, then heating to 80.degree. to effect **polymn.** which was stopped by immersing in liq. N. The mol. wt. distribution of the obtained poly(Et acrylate) approached 1.0 and **polymn.** control and mol. wt. of product are close to theor.

ST living radical **polymn** unsatd monomer xanthate **chain**

**transfer**; haloalkyl xanthate **chain transfer**  
agent block copolymer manuf; polyethyl acrylate manuf fluoroethylxanthyl  
propionate **chain transfer**

IT **Chain transfer**

**Chain transfer** agents

(controlled **living radical polymn.** using  
halogenated xanthates as **chain** coupling agents to obtain  
block copolymers of narrow mol. wt. distribution)

IT **Polymerization**

(**living, radical**; controlled **living**  
**radical polymn.** using halogenated xanthates as chain  
coupling agents to obtain block copolymers of narrow mol. wt.  
distribution)

IT **312731-29-6P 312731-30-9P 312731-31-0P**

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)

(**chain transfer** agent; controlled **living**  
**radical polymn.** using halogenated xanthates as  
**chain** coupling agents to obtain block copolymers of narrow mol.  
wt. distribution)

IT 9003-20-7P, Poly(vinyl acetate) 9003-32-1P, Poly(ethyl acrylate)  
9003-53-6P, Polystyrene 107948-08-3P, Styrene-vinyl acetate block  
copolymer 110772-34-4P, Butyl acrylate-styrene block copolymer  
111740-42-2P, Methyl acrylate-styrene block copolymer 114397-35-2P,  
Ethyl acrylate-styrene block copolymer 127972-36-5P, Styrene-tert-butyl  
acrylate block copolymer 135911-78-3P, Butyl acrylate-vinyl acetate  
block copolymer 218966-84-8P, Ethyl acrylate-vinyl acetate block  
copolymer 218966-86-0P, tert-Butyl acrylate-vinyl acetate block  
copolymer

RL: IMF (Industrial manufacture); PREP (Preparation)

(controlled **living radical polymn.** using  
halogenated xanthates as chain coupling agents to obtain block  
copolymers of narrow mol. wt. distribution)

IT 75-15-0, Carbon disulfide, reactions 75-89-8 535-11-5,  
Ethyl-2-bromopropionate 647-42-7, 3,3,4,4,5,5,6,6,7,7,8,8,8-  
Tridecafluoro-1-octanol 7646-69-7, Sodium hydride 35655-79-9,  
Heptafluorobutanol

RL: RCT (Reactant); RACT (Reactant or reagent)

(controlled **living radical polymn.** using  
halogenated xanthates as chain coupling agents to obtain block  
copolymers of narrow mol. wt. distribution)

IT 78-67-1, AIBN

RL: CAT (Catalyst use); USES (Uses)

(**radical** initiator; controlled **living**  
**radical polymn.** using halogenated xanthates as chain  
coupling agents to obtain block copolymers of narrow mol. wt.  
distribution)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Commw Scient Ind Res Org; WO 9213903 A 1992 HCAPLUS
- (3) Csontos, A; US 3862975 A 1975 HCAPLUS
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IT **312731-29-6P 312731-30-9P 312731-31-0P**

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)

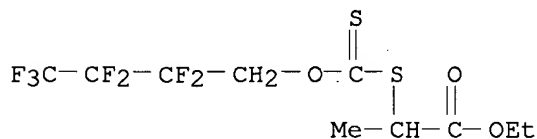
(**chain transfer** agent; controlled **living**



**radical polymn.** using halogenated xanthates as  
**chain** coupling agents to obtain block copolymers of narrow mol.  
 wt. distribution)

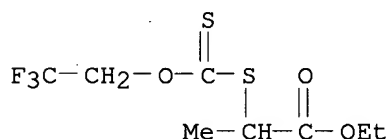
RN 312731-29-6 HCAPLUS

CN Propanoic acid, 2-[[[(2,2,3,3,4,4,4-heptafluorobutoxy)thioxomethyl]thio]-,  
 ethyl ester (9CI) (CA INDEX NAME)



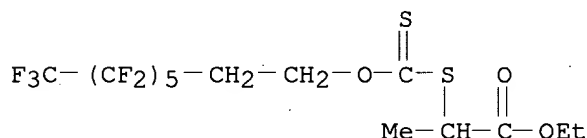
RN 312731-30-9 HCAPLUS

CN Propanoic acid, 2-[[[thioxo(2,2,2-trifluoroethoxy)methyl]thio]-, ethyl  
 ester (9CI) (CA INDEX NAME)



RN 312731-31-0 HCAPLUS

CN Propanoic acid, 2-[[[thioxo[(3,3,4,4,5,5,6,6,7,7,8,8,8-  
 tridecafluorooctyl)oxy]methyl]thio]-, ethyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 27 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:832139 HCAPLUS

DN 134:71969

TI Synthesis of butyl acrylate-styrene block copolymers in emulsion by  
 reversible addition-fragmentation chain transfer: effect of surfactant  
 migration upon film formation

AU Monteiro, Michael J.; Sjoberg, Marie; Van der Vlist, Jeroen; Gottgens,  
 Christianne M.

CS Department of Polymer Chemistry and Coatings Technology, Eindhoven  
 University of Technology, Eindhoven, 5600 MB, Neth.

SO Journal of Polymer Science, Part A: Polymer Chemistry (2000), 38(23),  
 4206-4217

CODEN: JPACEC; ISSN: 0887-624X

PB John Wiley & Sons, Inc.

DT Journal

LA English

CC 35-4 (Chemistry of Synthetic High **Polymers**)

AB The synthesis of block copolymers in an environmentally friendly medium

was carried out in emulsion polymns. through the reversible addn.-fragmentation **chain transfer** process, using a **transfer** active xanthate (MADIX) agent, i.e., [1-(O-ethylxanthyl)ethyl]benzene, under batch and starved-feed conditions. First, ab initio expts. were carried out to prep. a seed of PBA dormant chains (i.e., poly(Bu acrylate) (PBA) polymer attached with a **transfer** active xanthate). The no. av. mol. wt. and polydispersity were predicted accurately with numerical simulations and equations derived by Muller from the method of moments. Those seeds were then used in a second-stage **polymn.** under starved-feed and batch conditions to prep. composite polymer colloids of block PBA-co-poly(styrene). Under starved feed conditions, approx. 90% of total polymer consisted of blocks, whereas under batch conditions only 70% consisted of blocks, which is proposed to be due a higher entry efficiency and thus greater termination rate. The films of these latexes were examd. by at. force microscopy. Surfactant migration to the surface increased with an increase in the amt. of MADIX, resulting from a combination of a smaller particle size and a lower av. mol. wt.

- ST emulsion polymn butyl acrylate styrene; RAFT emulsion polymn acrylate styrene; MADIX agent emulsion polymn acrylate styrene; xanthate transfer agent emulsion polymn acrylate styrene
- IT **Polymerization**  
(emulsion, two-stage; synthesis of Bu acrylate-styrene block copolymers in emulsion by reversible addn.-fragmentation **chain transfer** and effect of surfactant migration on film formation)
- IT 7775-27-1, Sodium persulfate  
RL: CAT (Catalyst use); USES (Uses)  
(**polymn.** catalyst; synthesis of Bu acrylate-styrene block copolymers in emulsion by reversible addn.-fragmentation **chain transfer** and effect of surfactant migration on film formation)
- IT 151-21-3, Sodium dodecyl sulfate, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(surfactant; synthesis of Bu acrylate-styrene block copolymers in emulsion by reversible addn.-fragmentation chain transfer and effect of surfactant migration on film formation)
- IT 110772-34-4P, Butyl acrylate-styrene block copolymer  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(synthesis of Bu acrylate-styrene block copolymers in emulsion by reversible addn.-fragmentation chain transfer and effect of surfactant migration on film formation)
- IT 123972-86-1  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**transfer** active agent; synthesis of Bu acrylate-styrene block copolymers in emulsion by reversible addn.-fragmentation **chain transfer** and effect of surfactant migration on film formation)

RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

- (1) Asgarzadeh, F; Macromolecules 1999, V32, P6996 HCAPLUS
- (2) Blackley, D; Emulsion Polymerisation 1975
- (3) Charmot, D; WO 9858974 1997 HCAPLUS
- (4) Chiefari, J; Macromolecules 1998, V31, P5559 HCAPLUS
- (5) Chong, Y; Macromolecules 1999, V32, P2071 HCAPLUS
- (6) Desai, A; J Polym Sci Part A 2000, V38, P1033 HCAPLUS
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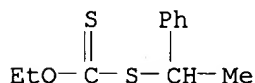
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- (15) Lam, S; J Appl Polym Sci 1997, V66, P187 HCAPLUS
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- (18) Muller, A; Macromolecules 1995, V28, P4326
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- (22) Winnik, M; Emulsion Polymerization and Emulsion Polymers 1996, P467

IT 123972-86-1

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (transfer active agent; synthesis of Bu acrylate-styrene  
 block copolymers in emulsion by reversible addn.-fragmentation  
 chain transfer and effect of surfactant migration on  
 film formation)

RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



L19 ANSWER 28 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:613535 HCAPLUS

DN 133:335522

TI Living free radical **polymerization** with reversible addition -  
 fragmentation **chain transfer** (the life of RAFT)

AU Moad, Graeme; Chiefari, John; Chong, Y. K.; Krstina, Julia; Mayadunne,  
 Roshan T. A.; Postma, Almar; Rizzardo, Ezio; Thang, San H.

CS CSIRO Molecular Science, Clayton South, 3169, Australia

SO Polymer International (2000), 49(9), 993-1001

CODEN: PLYIEI; ISSN: 0959-8103

PB John Wiley & Sons Ltd.

DT Journal

LA English

CC 35-4 (Chemistry of Synthetic High **Polymers**)

AB Free radical **polymn.** with reversible addn.-fragmentation

**chain transfer** (RAFT **polymn.**) is discussed  
 with a view to answering the following questions: (a) How living is RAFT  
**polymn.**.. (b) What controls the activity of thiocarbonylthio  
 compds. in RAFT **polymn.**.. (c) How do rates of **polymn.**  
 differ from those of conventional radical **polymn.**.. (d) Can RAFT  
 agents be used in emulsion **polymn.**.. Retardation, obsd. when  
 high concns. of certain RAFT agents are used and in the early stages of  
 emulsion **polymn.**.., and how to overcome it by appropriate choice  
 of reaction conditions, are considered in detail. Examples of the use of  
 thiocarbonylthio RAFT agents in emulsion and miniemulsion **polymn**  
 . are provided.

ST living radical **polymn** reversible addn fragmentation  
**chain transfer** agent

- IT **Polymerization**  
(emulsion; living free radical polymn.  
with reversible addn.-fragmentation chain transfer)
- IT **Chain transfer**  
**Chain transfer** agents  
Molecular weight  
Molecular weight distribution  
(living free radical polymn. with  
reversible addn.-fragmentation chain transfer)
- IT **Polymerization**  
(living, radical; living free  
radical polymn. with reversible addn.-fragmentation  
chain transfer)
- IT 2943-26-2 3052-61-7 5925-55-3 24472-74-0  
26504-29-0 27249-90-7 32894-08-9 37912-25-7 60795-38-2  
123972-86-1 201611-84-9 201611-86-1 227205-57-4  
227205-64-3 303040-80-4  
RL: NUU (Other use, unclassified); USES (Uses)  
(chain transfer agent; living free  
radical polymn. with reversible addn.-fragmentation  
chain transfer)
- IT 201611-77-0P 201611-85-0P  
RL: NUU (Other use, unclassified); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(chain transfer agent; living free  
radical polymn. with reversible addn.-fragmentation  
chain transfer)
- IT 75-15-0, Carbon disulfide, reactions 98-83-9, .alpha.-Methylstyrene,  
reactions 100-58-3, Phenyl magnesium bromide 121-68-6, Dithiobenzoic  
acid 41658-69-9, 2-Bromo-2-cyanopropane  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(for prepn. of reversible addn. fragmentation chain transfer agent)
- IT 9003-53-6P, Polystyrene  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(living free radical polymn. with  
reversible addn.-fragmentation chain transfer)
- IT 9003-49-0P, Poly(butyl acrylate) 9011-14-7P, Poly(methyl methacrylate)  
106911-77-7P, Methyl methacrylate-styrene block copolymer  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(living free radical polymn. with  
reversible addn.-fragmentation chain transfer)

RE.CNT 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

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IT 2943-26-2 24472-74-0 123972-86-1

227205-64-3

RL: NUU (Other use, unclassified); USES (Uses)

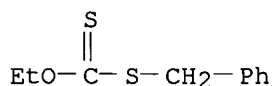
(chain transfer agent; living free

radical polymn. with reversible addn.-fragmentation

chain transfer)

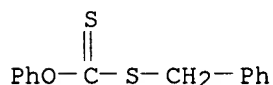
RN 2943-26-2 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



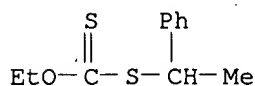
RN 24472-74-0 HCAPLUS

CN Carbonodithioic acid, O-phenyl S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



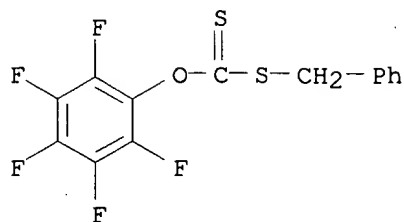
RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



RN 227205-64-3 HCAPLUS

CN Carbonodithioic acid, O-(pentafluorophenyl) S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



- L19 ANSWER 29 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2000:610043 HCAPLUS  
 DN 133:322211  
 TI Synthesis of defined polymers by reversible addition-fragmentation chain transfer: the RAFT process  
 AU Rizzardo, Ezio; Chiefari, John; Mayadunne, Roshan T. A.; Moad, Graeme; Thang, San H.  
 CS CSIRO Molecular Science, Clayton South MDC, 3169, Australia  
 SO ACS Symposium Series (2000), 768 (Controlled/Living Radical Polymerization), 278-296  
 CODEN: ACSMC8; ISSN: 0097-6156  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-4 (Chemistry of Synthetic High Polymers)  
 AB Free radical **polymn.** in the presence of thiocarbonylthio compds. of general structure Z-C(=S)S-R provides living polymers of predetd. mol. wt. and narrow mol. wt. distribution by a process of reversible addn.-fragmentation **chain transfer**. A rationale for selecting the most appropriate thiocarbonylthio compds. for a particular monomer type is presented with ref. to the **polymn.** of methacrylates, styrenes, acrylates, acrylamides and vinyl acetate. The efficacy of the process is further demonstrated by the synthesis of narrow polydispersity polystyrene-block-poly(Me acrylate)-block-polystyrene and 4-armed star polystyrene.  
 ST reversible addn fragmentation transfer radical polymn styrene methacrylate acrylate  
 IT **Polymerization**  
 (living, radical; synthesis of defined polymers by reversible addn.-fragmentation **chain transfer** with thiocarbonylthio compds.)  
 IT 303040-81-5P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (4-arm star; synthesis of defined polymers by reversible addn.-fragmentation chain transfer with thiocarbonylthio compds.)  
 IT 78-67-1, AIBN 2094-98-6, 1,1'-Azobis(1-cyclohexanecarbonitrile) 2589-57-3, 2,2'-Azobis(methyl isobutyrate) 2638-94-0, 4,4'-Azobis(4-cyanopentanoic acid) 39198-34-0, 2,2'-Azobis(2,4,4-trimethylpentane)  
 RL: CAT (Catalyst use); USES (Uses)  
 (synthesis of defined polymers by reversible addn.-fragmentation chain transfer with thiocarbonylthio compds.)  
 IT 151902-72-6P 303040-82-6P 303040-83-7P 303040-84-8P 303040-86-0P  
 303040-87-1P 303040-88-2P 303040-89-3P 303040-90-6P 303040-92-8P  
 303040-95-1P 303040-97-3P 303040-99-5P 303041-01-2P 303041-02-3P  
 303041-05-6P 303041-07-8P 303041-09-0P 303041-11-4P 303041-13-6P

303041-15-8P **303041-18-1P** 303041-20-5P 303041-21-6P  
 303041-23-8P 303041-25-0P **303041-27-2P 303041-28-3P**  
 303041-29-4P 303041-30-7P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis of defined polymers by reversible addn.-fragmentation  
**chain transfer** with thiocarbonylthio compds.)

IT 303040-79-1P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (triblock; synthesis of defined polymers by reversible  
 addn.-fragmentation chain transfer with thiocarbonylthio compds.)

RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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IT **303041-18-1P 303041-27-2P 303041-28-3P**

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis of defined polymers by reversible addn.-fragmentation  
**chain transfer** with thiocarbonylthio compds.)

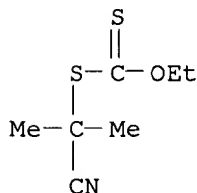
RN 303041-18-1 HCAPLUS

CN 2-Propenoic acid, 1,1-dimethylethyl ester, telomer with  
 S-(1-cyano-1-methylethyl) O-ethyl carbonodithioate (9CI) (CA INDEX NAME)

CM 1

CRN 218966-80-4

CMF C7 H11 N O S2

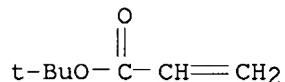


CM 2

CRN 25232-27-3  
CMF (C7 H12 O2)x  
CCI PMS

CM 3

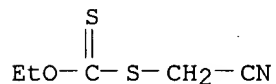
CRN 1663-39-4  
CMF C7 H12 O2



RN 303041-27-2 HCAPLUS  
CN Acetic acid ethenyl ester, telomer with S-(cyanomethyl) O-ethyl carbonodithioate (9CI) (CA INDEX NAME)

CM 1

CRN 59463-54-6  
CMF C5 H7 N O S2

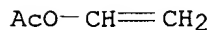


CM 2

CRN 9003-20-7  
CMF (C4 H6 O2)x  
CCI PMS

CM 3

CRN 108-05-4  
CMF C4 H6 O2

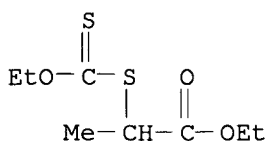


RN 303041-28-3 HCAPLUS  
CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester, telomer with ethenyl acetate (9CI) (CA INDEX NAME)

CM 1

CRN 73232-07-2  
CMF C8 H14 O3 S2





CM 2

CRN 9003-20-7

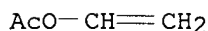
CMF (C4 H6 O2)x

CCI PMS

CM 3

CRN 108-05-4

CMF C4 H6 O2



L19 ANSWER 30 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:571778 HCAPLUS

DN 133:296786

TI Free-Radical Ring-Opening Polymerization of Cyclic Allylic Sulfides. 2.  
Effect of Substituents on Seven- and Eight-Membered Ring Low Shrink  
Monomers

AU Evans, Richard A.; Rizzardo, Ezio

CS CSIRO Molecular Science, Clayton South, 3169, Australia

SO Macromolecules (2000), 33(18), 6722-6731

CODEN: MAMOBX; ISSN: 0024-9297

PB American Chemical Society

DT Journal

LA English

CC 35-7 (Chemistry of Synthetic High **Polymers**)

AB The effect of substituents on the free-radical ring-opening polymn. behavior and polymn. vol. shrinkage of the cyclic allylic sulfides 6-methylene-1,4-dithiacycloheptane (2a) and 3-methylene-1,5-dithiacyclooctane (2b) has been investigated. The monomers were 2-(hydroxymethyl)-6-methylene-1,4-dithiacycloheptane (3a), 6-methylene-1,4-dithiacycloheptan-2-ylmethyl acetate (3b), 6-methylene-1,4-dithiacycloheptan-2-ylmethyl methacrylate (3c), 7-methylene-1,5-dithiacyclooctan-3-ol (4a), 7-methylene-1,5-dithiacyclooctan-3-yl acetate (4b), 7-methylene-1,5-dithiacyclooctan-3-yl benzoate (4c), and the bicyclic monomer bis(6-methylene-1,4-dithiacycloheptan-2-ylmethyl) diglycolate (5). The monomers were polymd. in bulk with thermal (AIBN, VAZO 88) and photochem. initiators (Darocur 1173) with selected soln. polymns. also performed. The presence of a substituent on the monomers gave clear amorphous polymers unlike the cryst. polymers obtained from the unsubstituted parent monomers (2) previously reported. The substituted, monofunctional seven-membered ring monomers (3a, b) polymerize to moderate conversions (ca. 60%) and gave amorphous, sol. sticky gumlike polymers. The difunctional monomer 3c in contrast gave an insol. rigid material. Eight-membered ring monomers 4a, 4b, and 4c were made to undergo complete conversions. The dual cyclic

monomer 5 was polymd. to give an insol. material contg. only traces of extractable monomer. Those liq. monomers 3c, 4b, and 5 that polymd. to complete conversion (3c, 4b) or near complete (5) were further examd. and gave polymn. shrinkages of 7.3, 2.0, and 2.1% (resp.) and glass transition points of 78.degree., -0.2.degree., and 28.degree., resp.

ST cyclic allylic sulfide ring opening polymn substituent effect

IT **Polymerization**

(**radical**, ring-opening; substituent effects on free-**radical** ring-opening **polymn.** of cyclic allylic sulfides)

IT Contraction (mechanical)

Glass transition temperature

Molecular weight distribution

(substituent effects on free-**radical** ring-opening **polymn.** of cyclic allylic sulfides)

IT Polythioalkylenes

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(substituent effects on free-**radical** ring-opening **polymn.** of cyclic allylic sulfides)

IT 52342-51-5P **301341-88-8P**

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(intermediate; substituent effects on free-**radical** ring-opening **polymn.** of cyclic allylic sulfides)

IT 180268-14-8P 180268-15-9P 180268-20-6P 180268-21-7P 301341-89-9P 301341-90-2P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(monomer; substituent effects on free-**radical** ring-opening **polymn.** of cyclic allylic sulfides)

IT 59-52-9, 2,3-Dimercapto-1-propanol 75-36-5, Acetyl chloride 98-88-4, Benzoyl chloride 140-89-6 920-46-7, Methacryloyl chloride 1871-57-4, 2-(Chloromethyl)-3-chloro-1-propene 21062-20-4, Diglycolyl dichloride

RL: RCT (Reactant); RACT (Reactant or reagent)

(starting material; substituent effects on free-**radical** ring-opening **polymn.** of cyclic allylic sulfides)

IT 180268-39-7P 180268-41-1P 180268-42-2P 301341-92-4P 301341-93-5P 301341-94-6P 301341-95-7P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(substituent effects on free-**radical** ring-opening **polymn.** of cyclic allylic sulfides)

IT 96-21-9, 1,3-Dibromo-2-propanol

RL: RCT (Reactant); RACT (Reactant or reagent)

(substituent effects on free-**radical** ring-opening **polymn.** of cyclic allylic sulfides)

IT 180268-27-3P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(substituent effects on free-**radical** ring-opening **polymn.** of cyclic allylic sulfides)

RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD

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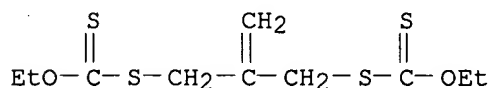
IT 301341-88-8P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(intermediate; substituent effects on free-radical ring-opening polymn. of cyclic allylic sulfides)

RN 301341-88-8 HCAPLUS

CN Carbonodithioic acid, S,S'-(2-methylene-1,3-propanediyl) O,O'-diethyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 31 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:375617 HCAPLUS

DN 133:120785

TI Minimization of Homopolymer Formation and Control of Dispersity in Free Radical Induced Graft Polymerization Using Xanthate Derived Macro-photoinitiators

AU Francis, R.; Ajayaghosh, A.

CS Photochemistry Research Unit Regional Research Laboratory, CSIR, Trivandrum, India

SO Macromolecules (2000), 33(13), 4699-4704

CODEN: MAMOBX; ISSN: 0024-9297

PB American Chemical Society

DT Journal

LA English

CC 35-8 (Chemistry of Synthetic High **Polymers**)

AB Several macro-photoinitiators of different compn. and mol. wts. were prepd. by the copolymn. of a photosensitive monomer, S-methacryloyl O-Et xanthate (MAX), using MMA or styrene as the comonomers. These macro-photoinitiators were used for the controlled grafting of monomers such as MMA and styrene under various exptl. conditions using 350 nm irradsn. The graft yields and the mol. wts. of the graft copolymers increased with increase in irradsn. time. Similarly, the mol. wts. of the graft copolymers increased with increase in mole percentage of the xanthate chromophores in the macroinitiators. The polydispersities of the graft copolymers remained below 1.5, which is the theor. limiting value for free radical induced polymn. reactions, except in the case of graft polymers obtained after prolonged irradsn. Noticeably, the formation of homopolymers could be suppressed, which is a great advantage of the present approach. The control over homopolymn. and polydispersities has been explained on the basis of the distinctly different reactivities of the free radicals generated by the macroinitiator. The macroradicals generated are mainly responsible for initiating the grafting of monomers whereas the less reactive thiocarbonylthiyl radicals are primarily involved in the termination of the graft chains, thereby preventing the homopolymer formation to a large extent. Thus, the use of xanthate-derived macro-photoinitiators is a simple and easy method for the synthesis of narrow dispersed graft copolymers, which are less contaminated with homopolymers.

ST MMA styrene graft polymer xanthate macro photoinitiators

IT **Polymerization**

(graft; minimization of homopolymer formation and control of dispersity in **radical** induced graft **polymn.** using xanthate derived macro-photoinitiators)

IT **162193-76-2**

RL: CAT (Catalyst use); USES (Uses)

(minimization of homopolymer formation and control of dispersity in **radical** induced graft **polymn.** using xanthate derived macro-photoinitiators)

IT 9011-14-7DP, PMMA, xanthate-terminated

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(minimization of homopolymer formation and control of dispersity in **radical** induced graft **polymn.** using xanthate derived macro-photoinitiators)

IT 107741-20-8P, Methyl methacrylate-styrene graft copolymer

RL: SPN (Synthetic preparation); PREP (Preparation)

(minimization of homopolymer formation and control of dispersity in **radical** induced graft **polymn.** using xanthate derived macro-photoinitiators)

RE.CNT 55 THERE ARE 55 CITED REFERENCES AVAILABLE FOR THIS RECORD

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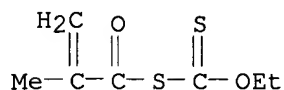
IT 162193-76-2

RL: CAT (Catalyst use); USES (Uses)

(minimization of homopolymer formation and control of dispersity in  
**radical** induced graft **polymn.** using xanthate derived  
 macro-photoinitiators)

RN 162193-76-2 HCAPLUS

CN 2-Propenethioic acid, 2-methyl-, anhydrosulfide with O-ethyl hydrogen  
 carbonodithioic acid (9CI) (CA INDEX NAME)



L19 ANSWER 32 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2000:290614 HCAPLUS  
 DN 133:43884  
 TI Controlled radical polymerization in dispersed media  
 AU Charmot, D.; Corpart, P.; Adam, H.; Zard, S. Z.; Biadatti, T.; Bouhadir, G.  
 CS Rhodia Recherches, Aubervilliers, 93310, Fr.  
 SO Macromolecular Symposia (2000), 150(Polymers in Dispersed Media), 23-32  
 CODEN: MSYMEC; ISSN: 1022-1360  
 PB Wiley-VCH Verlag GmbH  
 DT Journal  
 LA English  
 CC 35-4 (Chemistry of Synthetic High **Polymers**)  
 AB Free radical degenerative transfer promoted by dithiocarbonate groups is the basis of a new method for controlled free radical polymn. (MADIX). Thus, certain alkyl xanthates are used to impart livingness to radical polymn. of styrene, acrylates and vinyl acetate. Among other anal. methods, MALDI-TOF mass spectrometry showed unambiguously the living character of the process. The MADIX technique was implemented in emulsion polymn. straightforwardly with no retardation effects and an excellent fit between exptl. and theor. mol. wts.  
 ST styrene controlling radical polymn dithiocarbonate; vinyl acetate controlling radical polymn dithiocarbonate; ethyl acrylate controlling radical polymn dithiocarbonate  
 IT **Polymerization**  
 (radical; controlled radical polymn. in dispersed media)  
 IT 73232-07-2 123972-86-1 218966-75-7  
 218966-77-9  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (controlled radical polymn. in dispersed media)  
 IT 9003-20-7P, Poly(vinyl acetate) 9003-32-1P, Poly(ethyl acrylate)  
 9003-53-6P, Polystyrene  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (controlled radical polymn. in dispersed media)  
 RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE  
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IT 73232-07-2 123972-86-1 218966-75-7

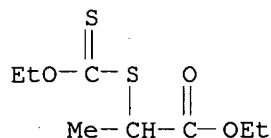
218966-77-9

RL: NUU (Other use, unclassified); USES (Uses)

(controlled **radical polymn.** in dispersed media)

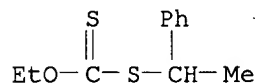
RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



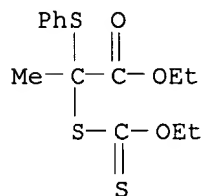
RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



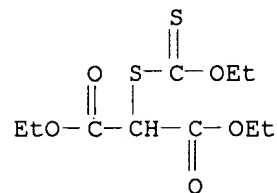
RN 218966-75-7 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-2-(phenylthio)-, ethyl ester (9CI) (CA INDEX NAME)



RN 218966-77-9 HCAPLUS

CN Propanedioic acid, [(ethoxythioxomethyl)thio]-, diethyl ester (9CI) (CA INDEX NAME)



AN 1999:807883 HCAPLUS  
 DN 132:93749  
 TI Syntheses and properties of .pi.-conjugated polymers containing tetrathiafulvalene in the polymer backbone  
 AU Tamura, Hiroshi; Watanabe, Tsuchitsugu; Imanishi, Kazukiyo; Sawada, Makoto  
 CS Faculty of Engineering and High Technology Research Center, Kansai University, Suita, 564-8680, Japan  
 SO Synthetic Metals (1999), 107(1), 19-25  
 CODEN: SYMEDZ; ISSN: 0379-6779  
 PB Elsevier Science S.A.  
 DT Journal  
 LA English  
 CC 35-7 (Chemistry of Synthetic High **Polymers**)  
 Section cross-reference(s): **36**, 73, 76  
 AB Tetrathiafulvalene (TTF)-contg. .pi.-conjugated polymers were prepd. from dibrominated TTF derivs. and diboronic acid derivs. using the Suzuki coupling reaction. The polymers have mol. wt. of 12,900-36,700 and excellent soly. in conventional org. solvents, attributed to the alkoxy chain. The electrochromism of the polymers was studied using spin-coated films on ITO glass plate; the color of the film changed reversibly from yellow to red purple depending on the applied potential. The electrochromic response was rapid and reproducible over a thousand redox cycles. Optoelectrochem. measurements of spin-coated polymer films revealed that the color change was assocd. with the electronic state of the TTF moiety, and the charge-transfer band to intermol. interactions between TTF moieties in different polymer chains.  
 ST tetrathiafulvalene diboronic acid deriv copolymer Suzuki coupling; conjugated polymer tetrathiafulvalene electrochromism charge transfer; conducting polymer charge transfer tetrathiafulvalene main chain  
 IT **Polymerization**  
 (Suzuki coupling; prepn. and electrochromism and charge **transfer** of electroactive .pi.-conjugated polymers with tetrathiafulvalene main **chain**)  
 IT Redox reaction  
 (electrochem.; prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)  
 IT Absorption spectra  
 (optoelectrochem.; prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)  
 IT Polymers, preparation  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (polytetrathiafulvalenes, polyphenylene; prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)  
 IT Cyclization  
 Electric conductivity  
 Electrochromic materials  
 Electrochromism  
 Electron transfer  
 (prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)  
 IT Polyphenyls  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (tetrathiafulvalene group contg.; prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)



- IT 14221-01-3, Tetrakis(triphenylphosphine)palladium  
 RL: CAT (Catalyst use); USES (Uses)  
 (coupling **polymn.** catalyst; prepn. and electrochromism and charge **transfer** of electroactive .pi.-conjugated polymers with tetrathiafulvalene main **chain**)
- IT 122-52-1, Triethyl phosphite  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (coupling reagent; prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)
- IT 7601-90-3, Perchloric acid, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (cyclization reagent; prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)
- IT 7553-56-2, Iodine, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (dopant; prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)
- IT **1861-49-0P**, O-Isopropyl-S-(p-bromophenacyl)dithiocarbonate  
 42574-14-1P, 4-(p-Bromophenyl)-1,3-dithiol-2-one 128424-36-2P,  
 2,5-Dibromo-1,4-dihexyloxybenzene 137436-30-7P, 2,5-Dibromo-1,4-didodecyloxybenzene 171089-85-3P, 1,4-Dihexyloxy-2,5-phenyldiboronic acid 211692-94-3P, 1,4-Didodecyloxy-2,5-phenyldiboronic acid  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (intermediate; prepn. and electrochromism and charge **transfer** of electroactive .pi.-conjugated polymers with tetrathiafulvalene main **chain**)
- IT 61485-52-7P, Bis(p-bromophenyl)tetrathiafulvalene 241802-45-9P, 1,4-Dihexyloxy-2,5-phenyldiboronic acid 1,3-propanediol diester 254907-55-6P, 1,4-Didodecyloxy-2,5-phenyldiboronic acid 1,3-propanediol diester  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (monomer; prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)
- IT 254907-58-9P, Bis(p-bromophenyl)tetrathiafulvalene-1,4-dihexyloxy-2,5-phenyldiboronic acid 1,3-propanediol diester copolymer 254907-61-4P, Bis(p-bromophenyl)tetrathiafulvalene-1,4-dihexyloxy-2,5-phenyldiboronic acid 1,3-propanediol diester copolymer, SRU 254907-65-8P, Bis(p-bromophenyl)tetrathiafulvalene-1,4-didodecyloxy-2,5-phenyldiboronic acid 1,3-propanediol diester copolymer 254907-68-1P, Bis(p-bromophenyl)tetrathiafulvalene-1,4-didodecyloxy-2,5-phenyldiboronic acid 1,3-propanediol diester copolymer, SRU  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)
- IT 99-73-0, p-Bromophenacyl bromide 121-43-7, Trimethoxyborane 140-92-1, Potassium isopropylxanthate 504-63-2, 1,3-Propanediol 3230-09-9, 1,4-Didodecyloxybenzene 7726-95-6, Bromine, reactions 67399-93-3, 1,4-Dihexyloxybenzene  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (prepn. and electrochromism and charge transfer of electroactive .pi.-conjugated polymers with tetrathiafulvalene main chain)
- RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD

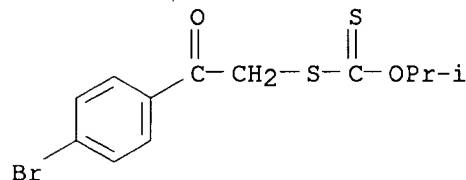
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IT **1861-49-0P**, O-Isopropyl-S-(p-bromophenacyl)dithiocarbonate  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (intermediate; prepn. and electrochromism and charge **transfer**  
 of electroactive .pi.-conjugated polymers with tetrathiafulvalene main  
**chain**)

RN 1861-49-0 HCAPLUS

CN Carbonodithioic acid, S-[2-(4-bromophenyl)-2-oxoethyl] O-(1-methylethyl)  
 ester (9CI) (CA INDEX NAME)



L19 ANSWER 34 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1999:420004 HCAPLUS

DN 131:200135

TI A Xanthate-Derived Photoinitiator that Recognizes and Controls the Free  
 Radical Polymerization Pathways of Methyl Methacrylate and Styrene

AU Ajayaghosh, A.; Francis, R.

CS Photochemistry Research Unit, Regional Research Laboratory CSIR,  
 Trivandrum, 695 019, India

SO Journal of the American Chemical Society (1999), 121(28), 6599-6606  
 CODEN: JACSAT; ISSN: 0002-7863

PB American Chemical Society

DT Journal

LA English

CC 35-4 (Chemistry of Synthetic High **Polymers**)

AB A xanthate derived photoinitiator, S-methacryloyl O-Et xanthate (MAX)  
 bearing an electron-deficient polymerizable double bond has been found to  
 be capable of distinguishing MMA and styrene, thereby dictating their  
 polymn. pathways in distinctly different and controlled fashion. The  
 structure, mol. wt., and the polydispersity of each polymer have been  
 detd. by spectral anal. and size-exclusion chromatog. (SEC). Photopolymn.

of MMA using MAX under 350-nm irradiation led to the formation of narrow dispersed ( $M_w/M_n < 1.5$ ) linear "macroinitiators" with methacryloyl and thiocarbonyl thiol end functional groups by a controlled free radical mechanism where the mol. wts. remained nearly the same, independent of irradiation time. The presence of the thiocarbonyl thiol group was further confirmed by the block copolymer of Me acrylate using the macroinitiator. On the other hand, photopolymerization of styrene with MAX showed considerable increase in mol. wts. and polydispersities with irradiation time, as in the case of a pseudo-"living" free radical polymerization. Nevertheless, in the present case, the mol. wt. increase and the broad polydispersity of polystyrene are explained on the basis of the branching of the polymer chain, which is supported by IR and NMR spectral analysis. This unusual behavior of MAX is attributed to its "tricky" approach toward MMA and styrene, making use of the electron availability around their double bonds. MAX behaves only as a photoinitiator toward the electron-deficient MMA, whereas it plays the dual role of a photoinitiator as well as a co-monomer toward electron-rich styrene due to a weak donor-acceptor interaction, leading to the initial formation of a macro-photoinitiator and the subsequent formation of branched and cross-linked polymers. Interestingly, S-benzoyl O-Et xanthate, an analogous photoinitiator without a polymerizable double bond, did not show any differences in the polymerization of MMA and styrene, thereby emphasizing the role of the methacryloyl moiety of MAX in controlling their polymerization pathways.

ST xanthate deriv methyl methacrylate styrene photoinitiator

IT **Polymerization catalysts**

(photopolymerization, **radical**; xanthate-derived photoinitiator for controlling **radical polymerization** of Me methacrylate and styrene)

IT **162193-76-2**

RL: CAT (Catalyst use); USES (Uses)

(xanthate-derived photoinitiator for controlling **radical polymerization** of Me methacrylate and styrene)

IT 9003-53-6P, Polystyrene 9011-14-7P, PMMA 242151-34-4P, Methacrylonitrile-methyl acrylate block copolymer

RL: SPN (Synthetic preparation); PREP (Preparation)

(xanthate-derived photoinitiator for controlling **radical polymerization** of Me methacrylate and styrene)

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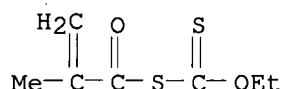
IT 162193-76-2

RL: CAT (Catalyst use); USES (Uses)

(xanthate-derived photoinitiator for controlling **radical**  
**polymn.** of Me methacrylate and styrene)

RN 162193-76-2 HCAPLUS

CN 2-Propenethioic acid, 2-methyl-, anhydrosulfide with O-ethyl hydrogen  
carbonodithioic acid (9CI) (CA INDEX NAME)



L19 ANSWER 35 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1999:405004 HCAPLUS  
 DN 131:45250  
 TI **Polymerization** with living characteristics with controlled  
 dispersity using **chain transfer** agents  
 IN Chiefair, John; Mayadunne, Roshan Tyrrel; Moad, Graeme; Rizzardo, Ezio;  
 Thang, San Hoa  
 PA E.I. Du Pont De Nemours and Company, USA; Commonwealth Scientific and  
 Industrial Research Organization  
 SO PCT Int. Appl., 92 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM C08F002-38  
 ICS C07C327-20; C07C327-52; C07C329-04; C07C329-12; C07C333-18  
 CC 35-4 (Chemistry of Synthetic High **Polymers**)  
 Section cross-reference(s): 27

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9931144	A1	19990624	WO 1998-US26428	19981211
	W: AU, BR, CA, IL, IN, JP, KR, MX, NZ, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	CA 2309279	AA	19990624	CA 1998-2309279	19981211
	AU 9919113	A1	19990705	AU 1999-19113	19981211
	BR 9815179	A	20001010	BR 1998-15179	19981211
	EP 1054906	A1	20001129	EP 1998-963877	19981211
	R: BE, CH, DE, DK, ES, FR, GB, IT, LI, NL, SE				
	JP 2002508409	T2	20020319	JP 2000-539065	19981211
	NZ 505654	A	20020328	NZ 1998-505654	19981211
PRAI	US 1997-68074P	P	19971218		
	US 1997-68157P	P	19971218		
	US 1997-69981P	P	19971218		
	WO 1998-US26428	W	19981211		
AB	Free radical <b>polymn.</b> of styrene, (meth)acrylates, and vinyl-type monomers using sulfur based xanthate-type <b>chain transfer</b> agents is widely compatible over a range of monomers and reaction conditions. Polymers having low polydispersity and predictable specific polymer architecture and mol. wt. are produced by the process, and are suitable for use as binders in automotive OEM and refinish coatings.				
ST	dithiocarboxylate <b>chain transfer</b> agent; acrylic <b>polymn chain transfer</b> agent; styrene <b>polymn chain transfer</b> agent				
IT	<b>Chain transfer</b> agents (Living <b>polymn.</b> with controlled dispersity using <b>chain transfer</b> agents)				
IT	<b>Polymerization</b> (living; Living <b>polymn.</b> with controlled dispersity using <b>chain transfer</b> agents)				
IT	<b>Polymerization</b>				

(**radical; Living polymn.** with controlled dispersity using **chain transfer agents**)

IT 9003-20-7P, PVA 9003-21-8P, Methyl acrylate homopolymer 9003-49-0P, Butyl acrylate homopolymer 9003-53-6P, Polystyrene 9011-14-7P, Pmma 24991-32-0P, Poly(vinyl benzoate) 25067-01-0P, Butyl acrylate-vinyl acetate copolymer 25232-27-3P, tert-Butyl acrylate homopolymer 106911-77-7P, Methyl methacrylate-styrene block copolymer

RL: IMF (Industrial manufacture); PRP (Properties); PREP (Preparation)

(**Living polymn.** with controlled dispersity using **chain transfer agents**)

IT 3052-61-7P **24472-74-0P 59463-54-6P** 60795-38-2P  
120924-70-1P **123972-86-1P 218966-80-4P** 220575-19-9P  
223264-13-9P 227205-57-4P 227205-58-5P 227205-59-6P 227205-60-9P  
227205-61-0P **227205-62-1P 227205-63-2P**  
**227205-64-3P** 227205-65-4P 227205-66-5P

RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(**Living polymn.** with controlled dispersity using **chain transfer agents**)

IT 75-15-0, Carbon disulfide, reactions 78-67-1, AIBN 100-39-0, Benzyl bromide 100-44-7, Benzyl chloride, reactions 100-53-8, Benzyl mercaptan 107-14-2, Chloroacetonitrile 109-97-7, Pyrrole 110-89-4, Piperidine, reactions 126-81-8 137-26-8, Tetramethylthiuram disulfide 140-89-6 147-84-2, reactions 151-01-9 463-71-8, Thiophosgene 585-71-7 590-17-0, Bromoacetonitrile 600-00-0 771-61-9, Pentafluorophenol 1005-56-7, Phenyl thionochloroformate 1074-82-4, Potassium phthalimide 6160-65-2, Thiocarbonyldiimidazole 13358-76-4 13472-08-7 36919-02-5 41658-69-9 60795-39-3, 1H-Pyrrole-1-carbodithioic acid 70134-04-2 71408-15-6 227205-67-6

RL: RCT (Reactant); RACT (Reactant or reagent)

(**Living polymn.** with controlled dispersity using **chain transfer agents**)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

- (1) Atochem Elf SA; EP 0592283 A 1994 HCAPLUS
- (2) Meiji Confectionary Co, Ltd; JP 45034804 B 1970 HCAPLUS
- (3) Minnesota Mining & Mfg; EP 0349232 A 1990 HCAPLUS
- (4) Minnesota Mining & Mfg; EP 0499619 A 1991 HCAPLUS
- (5) Mitsubishi Petrochemical Co; EP 0286376 A 1988 HCAPLUS
- (6) Quiclet-Sire, B; J Am Chem Soc 1996, V118(38), P9190 HCAPLUS
- (7) Tosoh Corp; EP 0421149 A 1991 HCAPLUS
- (8) Wakamori, S; Agr Biol Chem 1969, V33(12), P1691 HCAPLUS

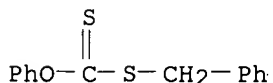
IT **24472-74-0P 59463-54-6P 123972-86-1P**  
**218966-80-4P 227205-62-1P 227205-63-2P**  
**227205-64-3P**

RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

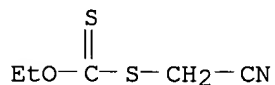
(**Living polymn.** with controlled dispersity using **chain transfer agents**)

RN 24472-74-0 HCAPLUS

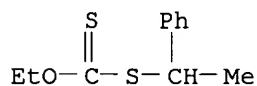
CN Carbonodithioic acid, O-phenyl S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



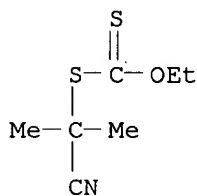
RN 59463-54-6 HCAPLUS  
 CN Carbonodithioic acid, S-(cyanomethyl) O-ethyl ester (9CI) (CA INDEX NAME)



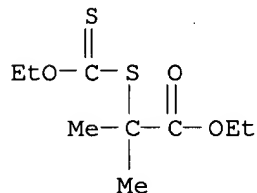
RN 123972-86-1 HCAPLUS  
 CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



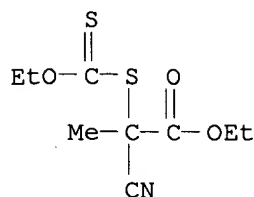
RN 218966-80-4 HCAPLUS  
 CN Carbonodithioic acid, S-(1-cyano-1-methylethyl) O-ethyl ester (9CI) (CA INDEX NAME)



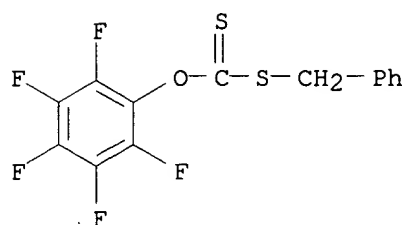
RN 227205-62-1 HCAPLUS  
 CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-2-methyl-, ethyl ester (9CI) (CA INDEX NAME)



RN 227205-63-2 HCAPLUS  
 CN Propanoic acid, 2-cyano-2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



RN 227205-64-3 HCAPLUS  
 CN Carbonodithioic acid, O-(pentafluorophenyl) S-(phenylmethyl) ester (9CI)  
 (CA INDEX NAME)



L19 ANSWER 36 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1999:27871 HCAPLUS  
 DN 130:82018  
 TI Block polymer synthesis by controlled radical polymerization  
 IN Corpart, Pascale; Charmot, Dominique; Biadatti, Thibaud; Zard, Samir;  
 Michelet, Daniel  
 PA Rhodia Chimie, Fr.  
 SO PCT Int. Appl., 70 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA French  
 IC ICM C08F293-00  
 ICS C08F002-38; C07C329-16  
 CC 35-4 (Chemistry of Synthetic High **Polymers**)  
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 9858974	A1	19981230	WO 1998-FR1316	19980623
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
FR 2764892	A1	19981224	FR 1997-7764	19970623
FR 2764892	B1	20000303		
AU 9883425	A1	19990104	AU 1998-83425	19980623
AU 740771	B2	20011115		
ZA 9805450	A	19990106	ZA 1998-5450	19980623
EP 991683	A1	20000412	EP 1998-933688	19980623



EP 991683 B1 20021009  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, NL, SE, PT, IE, FI  
 BR 9810289 A 20000919 BR 1998-10289 19980623  
 JP 2002512653 T2 20020423 JP 1999-503907 19980623  
 AT 225814 E 20021015 AT 1998-933688 19980623  
 ES 2186181 T3 20030501 ES 1998-933688 19980623  
 RU 2204568 C2 20030520 RU 2000-101870 19980623  
 TW 466247 B 20011201 TW 1998-87110087 19981007  
 US 6153705 A 20001128 US 1999-214880 19990114  
 MX 9911605 A 20000331 MX 1999-11605 19991213  
 NO 9906389 A 20000223 NO 1999-6389 19991222  
 PRAI FR 1997-7764 A 19970623  
 WO 1998-FR1316 W 19980623

AB Block copolymers are formed by contacting an ethylenically unsatd. monomer CY $\text{Y}'$  (=CW-CW')a=CH $_2$ , a precursor R $_2$ Z $_2$ C(S)Z $_1$ [CXX'(CV:CV')bCH $_2$ ]nR $_1$ , and a radical polymn. catalyst, where R $_1$  and R $_2$  are org. groups; V, V', W, and W' are H, alkyl, or halogen; X, X', Y, and Y' are H, OH, NH $_2$ , halogen, or an org. group; Z $_1$  = S or P; Z $_2$  = O, S, or P; a and b are 0 or 1; and n is .gtoreq.1. Thus, reaction of BrCHMeCO $_2$ Et with EtOC(S)SK gave EtOC(S)SCHMeCO $_2$ Et (I); heating 20 mmol Me acrylate with 1 mmol I in the presence of 0.02 mmol lauroyl peroxide at 80.degree. for 45 min gave a precursor homopolymer, which was heated with 20 mmol styrene and 0.02 mmol lauroyl peroxide at 110.degree. for 6 h to give a block copolymer with no.-av. mol. wt. 4650 and polydispersity 1.6.

ST block copolymer prepn living radical polymn; xanthate end group radical block copolymer

IT **Polymerization**  
 (block, radical; block copolymer synthesis by controlled radical polymn.)

IT **Polymerization**  
**Polymerization**  
 (living, radical; block copolymer synthesis by controlled radical polymn.)

IT 111740-42-2P, Methyl acrylate-styrene block copolymer 114397-35-2P, Ethyl acrylate-styrene block copolymer 127972-36-5P, tert-Butyl acrylate-styrene block copolymer 172905-57-6P, Butyl acrylate-ethyl acrylate block copolymer 218966-84-8P, Ethyl acrylate-vinyl acetate block copolymer 218966-85-9P, tert-Butyl acrylate-ethyl acrylate block copolymer 218966-86-0DP, tert-Butyl acrylate-vinyl acetate block copolymer, hydrolyzed 218966-86-0P, tert-Butyl acrylate-vinyl acetate block copolymer 218966-87-1P, tert-Butyl acrylate-ethyl acrylate-styrene block copolymer

RL: IMF (Industrial manufacture); PREP (Preparation)  
 (block copolymer synthesis by controlled radical polymn.)

IT 60-12-8, Phenethyl alcohol 75-84-3 78-67-1, AIBN 105-65-7 124-76-5, Isoborneol 140-89-6 502-55-6 535-11-5, Ethyl .alpha.-bromopropionate 585-71-7, (1-Bromoethyl)benzene 623-25-6, .alpha.,.alpha.'-Dichloro-p-xylene 4773-33-5, Ethyl .alpha.-chlorophenylacetate 14064-10-9, Diethyl chloromalonate 14160-07-7 42010-10-6, Azobisvaleronitrile 84938-90-9 96942-15-3, Potassium O-phenethyl xanthate 218966-76-8

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (block copolymer synthesis by controlled radical polymn.)

IT 73232-07-2P 123972-86-1P 133256-15-2P  
 218966-74-6P 218966-75-7P 218966-77-9P  
 218966-78-0P 218966-79-1P 218966-80-4P

**218966-81-5P 218966-82-6P 218966-83-7P**

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(initiator; block copolymer synthesis by controlled **radical polymn.**)

IT 9003-01-4DP, Poly(acrylic acid), xanthate-terminated 9003-20-7DP, Poly(vinyl acetate), xanthate-terminated 9003-21-8DP, Poly(methyl acrylate), xanthate-terminated 9003-32-1DP, Poly(ethyl acrylate), xanthate-terminated 9003-53-6DP, Polystyrene, xanthate-terminated 9003-77-4DP, Poly(2-ethylhexyl acrylate), xanthate-terminated  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(precursor; block copolymer synthesis by controlled **radical polymn.**)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

- (1) Consiglio Nazionale Delle Ricerche; EP 0582183 A 1994 HCAPLUS
- (2) Fryling, C; US 2396997 A 1946 HCAPLUS
- (3) Kuraray Co Ltd; EP 0348166 A 1989 HCAPLUS
- (4) Okawara, M; BULLETIN OF THE TOKYO INSTITUTE OF TECHNOLOGY 1966, V78, P1
- (5) Singer, H; FASERFORSCHUNG UND TEXTIL TECHNIK 1977, V28(9), P435 HCAPLUS
- (6) Suryawanshi, S; SYNTHETIC COMMUNICATIONS 1990, V20(5), P625 HCAPLUS
- (7) Yoshida, H; BULLETIN OF THE CHEMICAL SOC OF JAPAN 1971, V44, P3106 HCAPLUS

IT 73232-07-2P 123972-86-1P 133256-15-2P

218966-74-6P 218966-75-7P 218966-77-9P

218966-78-0P 218966-79-1P 218966-80-4P

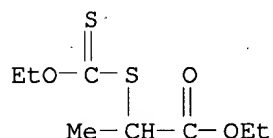
218966-81-5P 218966-82-6P 218966-83-7P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(initiator; block copolymer synthesis by controlled **radical polymn.**)

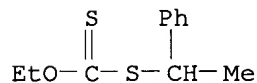
RN 73232-07-2 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



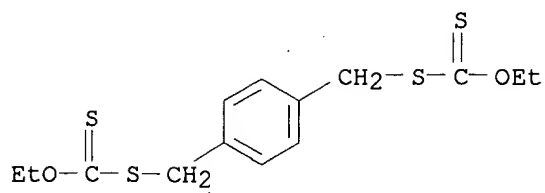
RN 123972-86-1 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(1-phenylethyl) ester (9CI) (CA INDEX NAME)



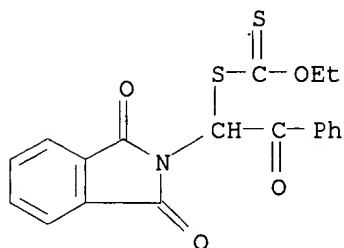
RN 133256-15-2 HCAPLUS

CN Carbonodithioic acid, S,S'-[1,4-phenylenebis(methylene)] O,O'-diethyl ester (9CI) (CA INDEX NAME)



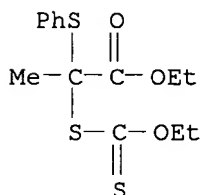
RN 218966-74-6 HCAPLUS

CN Carbonodithioic acid, S-[1-(1,3-dihydro-1,3-dioxo-2H-isoindol-2-yl)-2-oxo-2-phenylethyl] O-ethyl ester (9CI) (CA INDEX NAME)



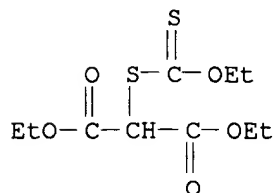
RN 218966-75-7 HCAPLUS

CN Propanoic acid, 2-[(ethoxythioxomethyl)thio]-2-(phenylthio)-, ethyl ester (9CI) (CA INDEX NAME)



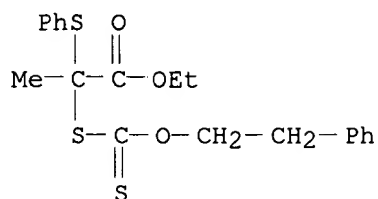
RN 218966-77-9 HCAPLUS

CN Propanedioic acid, [(ethoxythioxomethyl)thio]-, diethyl ester (9CI) (CA INDEX NAME)

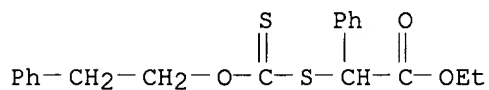


RN 218966-78-0 HCAPLUS

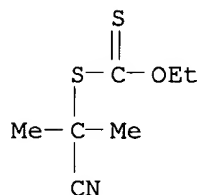
CN Propanoic acid, 2-[[[(2-phenylethoxy)thioxomethyl]thio]-2-(phenylthio)-, ethyl ester (9CI) (CA INDEX NAME)



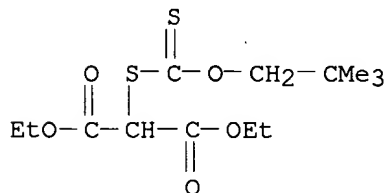
RN 218966-79-1 HCAPLUS  
 CN Benzeneacetic acid, .alpha.-[[ (2-phenylethoxy)thioxomethyl]thio]-, ethyl ester (9CI) (CA INDEX NAME)



RN 218966-80-4 HCAPLUS  
 CN Carbonodithioic acid, S-(1-cyano-1-methylethyl) O-ethyl ester (9CI) (CA INDEX NAME)

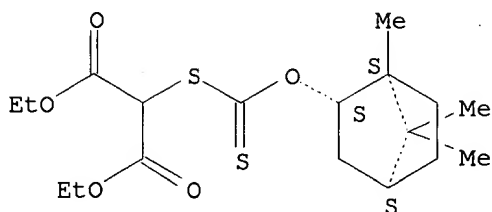


RN 218966-81-5 HCAPLUS  
 CN Propanedioic acid, [[ (2,2-dimethylpropoxy)thioxomethyl]thio]-, diethyl ester (9CI) (CA INDEX NAME)

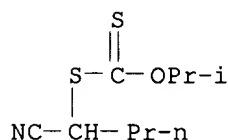


RN 218966-82-6 HCAPLUS  
 CN Propanedioic acid, [[thioxo[[ (1S,2S,4S)-1,7,7-trimethylbicyclo[2.2.1]hept-2-yl]oxy]methyl]thio]-, diethyl ester (9CI) (CA INDEX NAME)

Absolute stereochemistry.

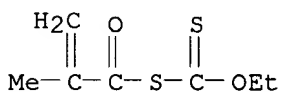


RN 218966-83-7 HCAPLUS  
 CN Carbonodithioic acid, S-(1-cyanobutyl) O-(1-methylethyl) ester (9CI) (CA INDEX NAME)



L19 ANSWER 37 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1998:89803 HCAPLUS  
 DN 128:128313  
 TI Narrow Polydispersed Reactive Polymers by a Photoinitiated Free Radical Polymerization Approach. Controlled Polymerization of Methyl Methacrylate  
 AU Ajayaghosh, A.; Francis, R.  
 CS Photochemistry Research Unit, Regional Research Laboratory (CSIR), Trivandrum, 695 019, India  
 SO Macromolecules (1998), 31(4), 1436-1438  
 CODEN: MAMOBX; ISSN: 0024-9297  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB A xanthate-derived monomer, S-methacryloyl O-Et xanthate (MAX) has been found to be a novel photoinitiator for free radical polymn. of Me methacrylate with significant control over the polymn. process, leading to narrowly dispersed polymers. The mol. wts. of the resultant polymers are found to be independent of the monomer conversion as in normal free radical polymn. process. On the other hand, a linear change in the mol. wts. was noticed with change in the initiator and the monomer concns. Interestingly, polydispersities of polymers prepd. using MAX are lower than those obtained by conventional free-radical polymns. and remained independent of the initiator concn., monomer concn. and the irradiation time. The resultant polymers are end capped with reactive functional groups which can subsequently be used as 'macroiniferters', which are useful for block copolymer synthesis.  
 ST PMMA radical polymn xanthate initiator; catalyst xanthate photopolymn methyl methacrylate  
 IT **Polymerization catalysts**  
 (S-methacryloyl O-Et xanthate; prepn. of narrowly dispersed PMMA by photoinitiated **radical polymn.** in presence of xanthate initiator)  
 IT **Chain transfer agents**  
 Polymerization catalysts

- (inifers; xanthate-terminated PMMA as macroinifers for block **polymn.**)
- IT **Polymerization**  
**Polymerization**  
(photochem., **radical**; prepn. of narrowly dispersed PMMA by photoinitiated **radical polymn.** in presence of xanthate initiator)
- IT Molecular weight distribution  
(prepn. of narrowly dispersed PMMA by photoinitiated **radical polymn.** in presence of xanthate initiator)
- IT **162193-76-2**  
RL: CAT (Catalyst use); USES (Uses)  
(prepn. of narrowly dispersed PMMA by photoinitiated **radical polymn.** in presence of xanthate initiator)
- IT 9011-14-7P, PMMA  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of narrowly dispersed PMMA by photoinitiated **radical polymn.** in presence of xanthate initiator)
- IT 9011-14-7DP, PMMA, xanthate-terminated  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(xanthate-terminated PMMA as macroinifers for block **polymn.**)
- IT **162193-76-2**  
RL: CAT (Catalyst use); USES (Uses)  
(prepn. of narrowly dispersed PMMA by photoinitiated **radical polymn.** in presence of xanthate initiator)
- RN 162193-76-2 HCAPLUS
- CN 2-Propenethioic acid, 2-methyl-, anhydrosulfide with O-ethyl hydrogen carbonodithioic acid (9CI) (CA INDEX NAME)



- L19 ANSWER 38 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN
- AN 1995:868135 HCAPLUS
- DN 123:258205
- TI Two-Dimensional Array of Poly(methacrylic acid) Brushes on Gold Substrates. Interaction with Ferrocene-Terminated Poly(oxyethylene)s
- AU Niwa, Masazo; Mori, Toshiaki; Higashi, Nobuyuki
- CS Faculty of Engineering, Doshisha University, Tanabe, 610-03, Japan
- SO Macromolecules (1995), 28(23), 7770-4  
CODEN: MAMOBX; ISSN: 0024-9297
- PB American Chemical Society
- DT Journal
- LA English
- CC 36-5 (Physical Properties of Synthetic High **Polymers**)  
Section cross-reference(s): 76
- AB **Polymeric** amphiphiles (1n), consisting of a poly(methacrylic acid) (PMAA) segment (segment length, n = 35 and 63) and two long alkyl chains whose ends are modified with disulfide, form self-assembled monolayers on gold electrodes. The lateral mol. distribution within the monolayers is successfully controlled by varying the conformational size of the PMAA segments during assembling. Ferrocene-terminated poly(oxyethylene)s (2m), having various **chain** lengths (m =

10-120) are prepd. and used as guest polymers. Host-guest interactions of 2m and the 1n monolayer-covered gold electrodes can be monitored electrochem. by means of electron **transfer** of the ferrocene moiety. The amt. of adsorbed 2m gives a max. when the **chain** length of guest 2m (m) matches that of host 1n monolayer (n). When the lateral mol. distribution in the monolayer brushes is controlled to be most favorable for the guest polymers, a 1:1 host-guest polymer complexation can be accomplished. FTIR spectroscopic data suggest that such complexation results from multiple hydrogen bonding between the COOH groups and the ether oxygen atoms.

ST gold electrode adsorbed modified polymethacrylic acid; ferrocene terminated polyoxyethylene interaction polyacrylic monolayer; chain length recognition polyoxyethylene immobilized electrode

IT Electrodes

(gold; interaction of two-dimensional array of poly(methacrylic acid) brushes on Au electrode with guest ferrocene-terminated poly(oxyethylene))

IT Chains, chemical

(length recognition; of of guest ferrocene-terminated poly(oxyethylene) by modified poly(methacrylic acid) monolayer-covered Au electrode)

IT Adsorbed substances

(monolayer, interaction of two-dimensional array of poly(methacrylic acid) brushes on Au electrode with guest ferrocene-terminated poly(oxyethylene))

IT Electric potential

(redox, of modified poly(methacrylic acid) monolayer-covered Au electrode after adsorption of guest ferrocene-terminated poly(oxyethylene))

IT 7440-57-5, Gold, uses

RL: NUU (Other use, unclassified); USES (Uses)

(electrodes; interaction of two-dimensional array of poly(methacrylic acid) brushes on Au electrode with guest ferrocene-terminated poly(oxyethylene))

IT 126082-73-3, Poly(oxy-1,2-ethanediyl), ..alpha..-[2-

[(ferrocenylcarbonyl)amino]ethyl]-..omega..-methoxy-

RL: PRP (Properties)

(guest polymers; interaction of two-dimensional array of poly(methacrylic acid) brushes on Au electrode with guest ferrocene-terminated poly(oxyethylene))

IT 25087-26-7D, Poly(methacrylic acid), [[bis[[ (ethylthioundecanoyl)oxy]ethyl]carbamoyl]methyl] dithiocarbonate-terminated **127396-24-1D**, reaction products with poly(methacrylic acid)

RL: PRP (Properties)

(interaction of two-dimensional array of poly(methacrylic acid) brushes on Au electrode with guest ferrocene-terminated poly(oxyethylene))

IT 74290-33-8, Poly(oxy-1,2-ethanediyl), .alpha.-ethyl-.omega.-methoxy-

RL: RCT (Reactant); RACT (Reactant or reagent)

(interaction of two-dimensional array of poly(methacrylic acid) brushes on Au electrode with guest ferrocene-terminated poly(oxyethylene))

IT 7447-40-7, Potassium chloride, uses

RL: NUU (Other use, unclassified); USES (Uses)

(supporting electrolyte; interaction of two-dimensional array of poly(methacrylic acid) brushes on Au electrode with guest ferrocene-terminated poly(oxyethylene))

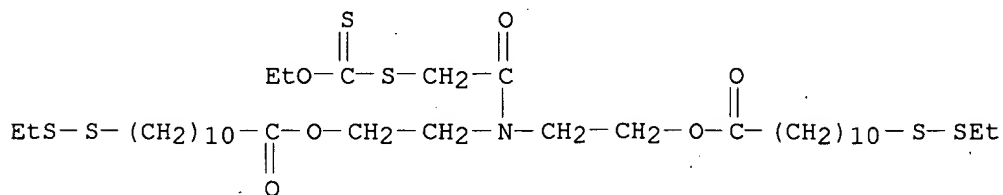
IT **127396-24-1D**, reaction products with poly(methacrylic acid)

RL: PRP (Properties)

(interaction of two-dimensional array of poly(methacrylic acid) brushes on Au electrode with guest ferrocene-terminated poly(oxyethylene))

RN 127396-24-1 HCAPLUS

CN Undecanoic acid, 11-(ethyldithio)-, [[[ethoxythioxomethyl)thio]acetyl]imino]di-2,1-ethanediyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 39 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1995:455114 HCAPLUS

DN 122:214634

TI Synthesis, characterization and radical copolymerization behavior of S-methacryloyl O-ethyl xanthate

AU Francis, R.; Ajayaghosh, A.

CS Photochemistry Res. Unit, Regional Res. Lab., Trivandrum, 695019, India

SO Polymer (1995), 36(5), 1091-6

CODEN: POLMAG; ISSN: 0032-3861

PB Elsevier

DT Journal

LA English

CC 35-3 (Chemistry of Synthetic High **Polymers**)

AB The sulfur-contg. photosensitive monomer, S-methacryloyl O-Et xanthate (I), was prepd. and characterized. Attempts to make the corresponding S-acryloyl O-Et xanthate under identical exptl. conditions resulted in the formation of S-(3-hydroxypropionyl) O-Et xanthate as the major product. The free-radical copolymn. behavior of I with Me methacrylate (II) and styrene (III) was studied in detail. The copolymer yield and mol. wt. were found to decrease with increasing I concn. in the monomer feed, which was attributed to the high chain transfer property of I. Copolymer compns. detd. independently by S and <sup>1</sup>H NMR analyses were in good agreement. Reactivity ratios of the monomers were calcd. by the Finemann-Ross, Kelen-Tudos and nonlinear least-squares methods. Detn. of Q and e values revealed that I is an electron-deficient monomer and is more reactive towards electron-rich monomers such as III. The I-III monomer system had a greater tendency towards alternation during copolymn. than the I-II monomer system. The thermal stability of the copolymers decreased with an increase in I mole fraction.

ST radical polymn methacryloyl ethyl xanthate; reactivity ratio radical polymn xanthate; Q e value polymn xanthate

IT Q-e value in **polymerization**Reactivity ratio in **polymerization**

(**radical**, of S-methacryloyl O-Et xanthate with Me methacrylate and styrene)

IT **Polymerization**

(**radical**, of S-methacryloyl O-Et xanthate with styrene and Me methacrylate)

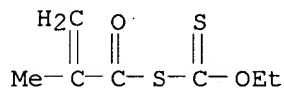
IT **162193-76-2P**

RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)

(monomer; synthesis, characterization and radical copolymn. behavior of S-methacryloyl O-Et xanthate)



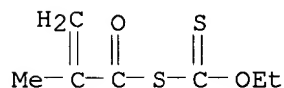
- IT 80-62-6 100-42-5, processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (radical polymn. with S-methacryloyl O-Et xanthate;  
 reactivity ratios and Q-e values in)
- IT 140-89-6 920-46-7, Methacryloyl chloride  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reactant; synthesis, characterization and radical copolymn. behavior  
 of S-methacryloyl O-Et xanthate)
- IT 162193-78-4P 162193-79-5P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis, characterization and radical copolymn. behavior of  
 S-methacryloyl O-Et xanthate)
- IT 162193-77-3P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis, characterization and radical copolymn. behavior of  
 S-methacryloyl O-Et xanthate)
- IT 162193-76-2P  
 RL: PEP (Physical, engineering or chemical process); SPN (Synthetic  
 preparation); PREP (Preparation); PROC (Process)  
 (monomer; synthesis, characterization and radical copolymn. behavior of  
 S-methacryloyl O-Et xanthate)
- RN 162193-76-2 HCAPLUS
- CN 2-Propenethioic acid, 2-methyl-, anhydrosulfide with O-ethyl hydrogen  
 carbonodithioic acid (9CI) (CA INDEX NAME)



- IT 162193-78-4P 162193-79-5P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis, characterization and radical copolymn. behavior of  
 S-methacryloyl O-Et xanthate)
- RN 162193-78-4 HCAPLUS
- CN 2-Propenoic acid, 2-methyl-, methyl ester, polymer with  
 2-methyl-2-propenethioic acid anhydrosulfide with O-ethyl hydrogen  
 carbonodithioate (9CI) (CA INDEX NAME)

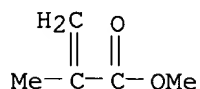
CM 1

CRN 162193-76-2  
 CMF C7 H10 O2 S2

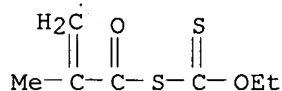


CM 2

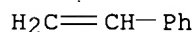
CRN 80-62-6  
 CMF C5 H8 O2



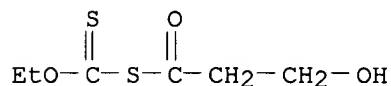
RN 162193-79-5 HCAPLUS  
 CN 2-Propenethioic acid, 2-methyl-, anhydrosulfide with O-ethyl hydrogen carbonodithioate, polymer with ethenylbenzene (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 162193-76-2  
 CMF C7 H10 O2 S2



CM 2  
 CRN 100-42-5  
 CMF C8 H8



IT **162193-77-3P**  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis, characterization and radical copolymn. behavior of  
 S-methacryloyl O-Et xanthate)  
 RN 162193-77-3 HCAPLUS  
 CN Propanethioic acid, 3-hydroxy-, anhydrosulfide with O-ethyl hydrogen carbonodithioate (9CI) (CA INDEX NAME)

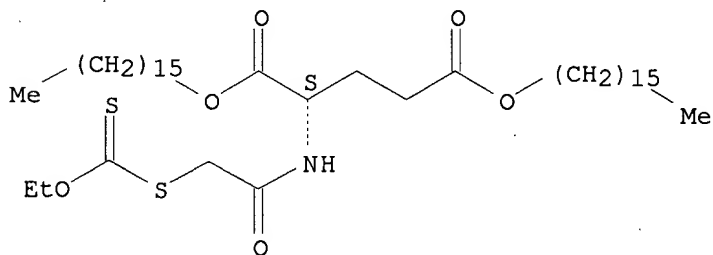


L19 ANSWER 40 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1990:99311 HCAPLUS  
 DN 112:99311  
 TI A novel two-dimensional photopolymerization at an oriented bilayer surface. Effective molecular-weight control using membrane state and chain transfer  
 AU Higashi, Nobuyuki; Adachi, Takato; Niwa, Masazo  
 CS Fac. Eng., Doshisha Univ., Kyoto, 602, Japan  
 SO Macromolecules (1990), 23(5), 1475-80  
 CODEN: MAMOBX; ISSN: 0024-9297  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)

- AB Very high-mol.-wt. polymers were produced from dihexadecyl N-(trimethylammonioacetyl)-L-glutamate p-styrenesulfonate (I) under mild conditions in a bilayer state by fixation of the photoinitiator dihexadecyl N-[ethoxy(thiocarbonyl)thioacetyl]-L-glutamate at the most effective position for initiation. A similar situation was obsd. for the **chain-transfer** reaction at the bilayer surface: a **chain-transfer** agent with double alkyl chains could acutely control the mol. wt. of the polymers using the bilayer system whereas a similar compd. lacking the long alkyl chains (iso-PrO<sub>2</sub>CCBr<sub>3</sub>) could not act as a mol. wt. regulator. The phase sepn. of bilayers composed of a nonpolymerizable fluorocarbon component and I was useful for controlling the mol. wt. This study showed that completely regulatable **polymn.** at a 2-dimensional bilayer surface should require not only orientation of the monomer mol. at a membrane surface but also an optimum mol. design of the photoinitiator and the **chain-transfer** agent.
- ST photopolymn bilayer orientation control; **chain transfer** **polymn** glutamate
- IT Chain-transfer agents  
(dihexadecyl glutamate derivs., for bilayer photopolymn. of styrenesulfonate derivs.)
- IT Polymerization catalysts  
(photochem., two-dimensional, dihexadecyl glutamate derivs., for styrenesulfonate derivs.)
- IT Polymerization  
(photochem., two-dimensional, of dihexadecyl glutamate styrenesulfonate derivs., mol. wt. control in)
- IT 32939-15-4P, Iso-Pr tribromoacetate  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and attempted use as bilayer photopolymn. chain-transfer agent)
- IT 125074-97-7P, Dihexadecyl N-(trimethylammonioacetyl)-L-glutamate p-styrenesulfonate  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and bilayer photopolymn. of)
- IT 124993-14-2P, Dihexadecyl N-(tribromoacetyl)-L-glutamate  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, as bilayer photopolymn. chain-transfer agent)
- IT **124993-13-1P**, Dihexadecyl N-[ethoxy(thiocarbonyl)thioacetyl]-L-glutamate  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, as bilayer photopolymn. initiator)
- IT 119385-36-3P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, as bilayer photopolymn. mol. wt. control agent)
- IT 125132-85-6P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, by bilayer photopolymn., mol. wt. control in)
- IT 124993-15-3  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with chlorooxodioxaphosphorane)
- IT 140-90-9, Sodium ethyl xanthate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with dihexadecyl chloroacetylglutamate)
- IT 34718-47-3, Tribromoacetyl chloride  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with dihexadecyl glutamate tosylate)
- IT 2695-37-6, Sodium p-styrenesulfonate

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with dihexadecyl trimethylammonioacetylglutamate)  
 IT 6609-64-9, 2-Chloro-2-oxo-1,3,2-dioxaphosphorane  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with fluoroalkyl glutamates)  
 IT 156-38-7D, p-Hydroxyphenylacetic acid, derivs.  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with fluoroalkyl glutamates and di-Et phosphorocyanidate)  
 IT 88185-42-6  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with hydroxyphenyl acetate and di-Et phosphorocyanidate)  
 IT 2942-58-7, Diethyl phosphorocyanidate  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with hydroxyphenyl acetates and fluoroalkyl glutamates)  
 IT 125023-18-9  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with sodium Et xanthate)  
 IT 120904-49-6  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with sodium styrenesulfonate)  
 IT 67-63-0, 2-Propanol, reactions 95992-27-1  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with tribromoacetyl chloride)  
 IT **124993-13-1P**, Dihexadecyl N-[ethoxy(hiocarbonyl)thioacetyl]-L-glutamate  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. of, as bilayer photopolymer. initiator)  
 RN 124993-13-1 HCAPLUS  
 CN L-Glutamic acid, N-[(ethoxythioxomethyl)thio]acetyl]-, dihexadecyl ester  
 (9CI) (CA INDEX NAME)

Absolute stereochemistry.



L19 ANSWER 41 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1988:631623 HCAPLUS  
 DN 109:231623  
 TI Molecular design of block and graft copolymers by vinyl-substituted xanthates  
 AU Niwa, Masazo; Higashi, Nobuyuki; Shimizu, Motoyuki; Matsumoto, Takahiro  
 CS Dep. Appl. Chem., Doshisha Univ., Kyoto, 602, Japan  
 SO Makromolekulare Chemie (1988), 189(9), 2187-99  
 CODEN: MACEAK; ISSN: 0025-116X  
 DT Journal  
 LA English  
 CC 35-3 (Chemistry of Synthetic High **Polymers**)  
 AB The selective **polymn.** behavior of O-Et S-4-vinylbenzyl xanthate

(I) was investigated on the basis of **polymn.** kinetics in the dark and in the presence of UV light. S-Benzyl O-Et xanthate was used as a nonpolymerizable model compd. of I to evaluate **chain transfer** consts. In the homopolymn. and the copolymn. of I initiated with AIBN in the dark, styryl groups selectively took part in the **polymn.**, and xanthate groups were not responsible for it. The monomer reactivity ratios ( $r_I = 0,51$  and  $r_{II} = 0,41$ ) of I with Me methacrylate (II) were very close to those of styrene with II. The **polymn.** of II was carried out with I upon photoirradn. No.-av. degrees of **polymn.** of the polymers obtained increased linearly with conversion. Block and graft copolymers were prepd. by using these macrophotoinitiators.

- ST ethyl vinylbenzyl xanthate polymn kinetics; reactivity ratio ethyl vinylbenzyl xanthate; block ethyl vinylbenzyl xanthate copolymer; graft ethyl vinylbenzyl xanthate copolymer
- IT Reactivity ratio in polymerization  
(of Et vinylbenzyl xanthate with Me methacrylate or styrene)
- IT Kinetics of polymerization  
(of Me methacrylate, in presence of Et vinylbenzyl xanthate)
- IT Polymerization catalysts  
(xanthates, for Me methacrylate and styrene)
- IT Polymerization  
(block, of xanthate-terminated polystyrene macromonomer with Me methacrylate)
- IT Polymerization  
(graft, of Et vinylbenzyl xanthate with Me methacrylate and styrene)
- IT **2943-26-2**  
RL: USES (Uses)  
(**chain-transfer** agent, **polymn.** of styrene in presence of)
- IT 80-62-6, Methyl methacrylate 100-42-5, Styrene, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(polymn. of, with Et vinylbenzyl xanthate, reactivity ratio in)
- IT **117533-22-9P**, O-Ethyl S-4-vinylbenzyl xanthate homopolymer  
**117533-23-0P 117533-24-1P**  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and characterization of)
- IT **117533-21-8P**  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and polymn. of)
- IT 9003-53-6DP, Polystyrene, xanthate-terminated  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn. and polymn. of, with Me methacrylate)
- IT 9003-53-6P, Polystyrene  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, in presence of benzyl Et xanthate chain transfer agent)
- IT 9011-14-7P, PMMA  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, in presence of benzyl Et xanthate chain-transfer agent)
- IT 106911-77-7P, Methyl methacrylate-styrene block copolymer  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, using xanthate-terminated polystyrene macromonomer)
- IT 1592-20-7, 4-Vinylbenzyl chloride  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with sodium Et xanthate)
- IT 140-90-9, Sodium O-ethyl xanthate

RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with vinylbenzyl chloride)

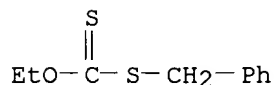
IT **2943-26-2**

RL: USES (Uses)

(**chain-transfer** agent, **polymn.** of styrene  
in presence of)

RN 2943-26-2 HCAPLUS

CN Carbonodithioic acid, O-ethyl S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



IT **117533-22-9P**, O-Ethyl S-4-vinylbenzyl xanthate homopolymer  
**117533-23-0P 117533-24-1P**

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. and characterization of)

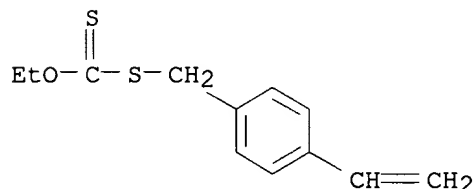
RN 117533-22-9 HCAPLUS

CN Carbonodithioic acid, S-[(4-ethenylphenyl)methyl] O-ethyl ester,  
homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 117533-21-8

CMF C12 H14 O S2



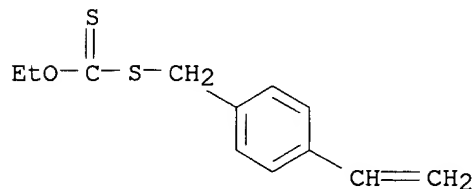
RN 117533-23-0 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, methyl ester, polymer with  
S-[(4-ethenylphenyl)methyl] O-ethyl carbonodithioate (9CI) (CA INDEX NAME)

CM 1

CRN 117533-21-8

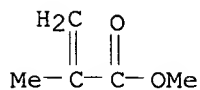
CMF C12 H14 O S2



CM 2

CRN 80-62-6

CMF C5 H8 O2



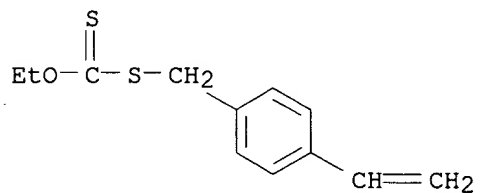
RN 117533-24-1 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethenylbenzene and  
S-[(4-ethenylphenyl)methyl] O-ethyl carbonodithioate, graft (9CI) (CA  
INDEX NAME)

CM 1

CRN 117533-21-8

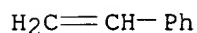
CMF C12 H14 O S2



CM 2

CRN 100-42-5

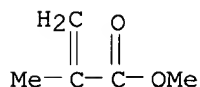
CMF C8 H8



CM 3

CRN 80-62-6

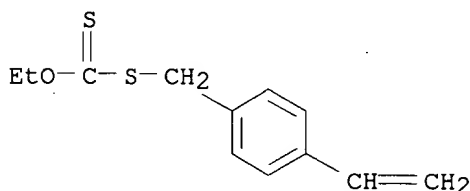
CMF C5 H8 O2



IT 117533-21-8P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

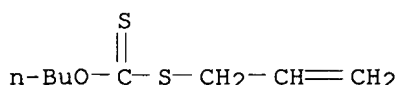
(prepn. and polymn. of)  
 RN 117533-21-8 HCAPLUS  
 CN Carbonodithioic acid, S-[(4-ethenylphenyl)methyl] O-ethyl ester (9CI) (CA INDEX NAME)



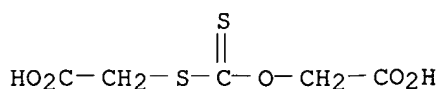
L19 ANSWER 42 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1980:621291 HCAPLUS  
 DN 93:221291  
 TI Inhibitor and control agent for thermal polymerization of  
 2-methyl-5-vinylpyridine  
 IN Popov, A. V.; Gorbunov, B. N.; Tsarenko, S. V.  
 PA USSR  
 SO U.S.S.R.  
 From: Otkrytiya, Izobret., Prom. Obraztsy, Tovarnye Znaki 1980, (27), 104.  
 CODEN: URXXAF  
 DT Patent  
 LA Russian  
 IC C08F002-38  
 CC 35-2 (Synthetic High **Polymers**)  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	SU 749848	T	19800723	SU 1978-2631740	19780621
PRAI	SU 1978-2631740		19780621		
AB	Allyl butylxanthate [ <b>7124-53-0</b> ] was used as an inhibitor and control agent for thermal polymn. of 2-methyl-5-vinylpyridine [140-76-1].				
ST	vinylmethylpyridine polymn inhibition; allyl butylxanthate polymn inhibitor; xanthate polymn inhibitor				
IT	Polymerization inhibitors (allyl butylxanthate, for methylvinylpyridine)				
IT	<b>Chain-transfer</b> agents (allyl butylxanthate, for <b>polymn.</b> of methylvinylpyridine)				
IT	140-76-1 RL: USES (Uses) (polymn. inhibitors for, allyl butylxanthate as)				
IT	<b>7124-53-0</b> RL: USES (Uses) (polymn. inhibitors, for methylvinylpyridine)				
IT	<b>7124-53-0</b> RL: USES (Uses) (polymn. inhibitors, for methylvinylpyridine)				
RN	7124-53-0 HCAPLUS				
CN	Carbonodithioic acid, O-butyl S-2-propenyl ester (9CI) (CA INDEX NAME)				





- L19 ANSWER 43 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1978:51197 HCAPLUS  
 DN 88:51197  
 TI .alpha.,.omega.-Functionalized oligomers - new application of radical emulsion polymerization  
 AU Singer, Hans; Jezierski, Aleksander; Schneider, Juergen; Wendler, Karin  
 CS Sekt. Chem., Tech. Hochsch. "Carl Schorlemmer", Launa-Merseburg, Ger. Dem. Rep.  
 SO Faserforschung und Textiltechnik (1977), 28(9), 435-8  
 CODEN: FSTXA7; ISSN: 0014-8628  
 DT Journal  
 LA German  
 CC 35-3 (Synthetic High **Polymers**)  
 AB Butadiene was emulsion **polymd.** to low-mol.-wt. products in the presence of dialkyl xanthogen disulfide, diaryl disulfide, S,S'-carbonylbis(mercaptocarboxylic acid), and related compds. as **chain** regulators, giving polybutadiene oligomers contg. functional end groups. The apparent **chain transfer** const. varied from 0.37 for p,p'-diaminodiphenyl disulfide [722-27-0] to 22 for EtO(CH<sub>2</sub>)<sub>2</sub>OC(:S)SSC(:S)O(CH<sub>2</sub>)<sub>2</sub>OEt [41544-02-9], and an appropriate choice of regulator was used to adjust the no. av. mol. wt. at .ltoreq.104 and functionality .gtoreq.2. The structure-activity relationship of the **chain** regulators was discussed. The functional group and the polybutadiene were thermalized to mercapto groups, giving products which were convertible to polyurethanes. These polyurethanes were well described by a 2-phase model and did not have phys. and mech. properties equiv. to those of com. polyester diol polyurethanes.  
 ST functionalized oligomeric polybutadiene; chain transfer agent butadiene; xanthogen disulfide chain transfer; disulfide chain transfer agent; polyurethane mercapto terminated polybutadiene  
 IT Chain-transfer agents  
     (sulfur compds., for butadiene, functionalization by)  
 IT Urethane polymers, preparation  
     RL: SPN (Synthetic preparation); PREP (Preparation)  
     (mercapto-terminated oligomeric polybutadiene-based, prepn. of)  
 IT 105-65-7 502-55-6 722-27-0 1141-88-4 **6310-26-5** 6326-83-6  
     13052-61-4 23363-97-5 40897-41-4 41544-02-9 65291-49-8  
     RL: USES (Uses)  
     (**chain transfer** agents, for **polymn.** of butadiene, functionalization by)  
 IT 9003-17-2D, mercapto-terminated  
     RL: USES (Uses)  
     (oligomeric, polyurethane based on)  
 IT **6310-26-5**  
     RL: USES (Uses)  
     (**chain transfer** agents, for **polymn.** of butadiene, functionalization by)  
 RN 6310-26-5 HCAPLUS  
 CN Acetic acid, [[[carboxymethoxy]thioxomethyl]thio]- (9CI) (CA INDEX NAME)



L19 ANSWER 44 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1977:73407 HCAPLUS  
 DN 86:73407  
 TI Symmetrical azo-bis(mercapto) compounds  
 IN Hitzler, Otto; Pennewiss, Horst; Froehlich, August; Markert, Gerhard  
 PA Roehm G.m.b.H., Fed. Rep. Ger.  
 SO Ger. Offen., 14 pp.  
 CODEN: GWXXBX  
 DT Patent  
 LA German  
 IC C07C149-14  
 CC 35-4 (Synthetic High **Polymers**)  
 Section cross-reference(s): 23

FAN.CNT 1

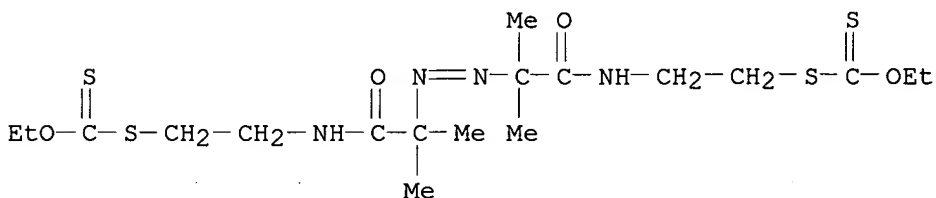
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 2518622	A1	19761104	DE 1975-2518622	19750426
	FR 2308617	A1	19761119	FR 1976-9934	19760406
	FR 2308617	B1	19800808		
	GB 1491654	A	19771109	GB 1976-16888	19760426
PRAI	DE 1975-2518622		19750426		
AB	RNHCOCMe2N:NCMe2CONHR (I, R = (CH2)3O2CCH2SH (II) [61551-72-2], (CH2)2O2CCH2SH [61551-73-3], (CH2)2SH [61551-74-4]) functioning as both radical <b>polymn.</b> initiator and <b>chain transfer</b> agent were prep'd. For example, II was prep'd. in 50% yield from I [R = (CH2)3OH] [61551-75-5] and thioglycolic acid [68-11-1].				
ST	azodiisobutyramide mercapto deriv				
IT	Thiols, preparation				
	RL: SPN (Synthetic preparation); PREP (Preparation) (azo)				
IT	Azo compounds				
	RL: SPN (Synthetic preparation); PREP (Preparation) (mercapto)				
IT	61551-69-7				
	RL: RCT (Reactant); RACT (Reactant or reagent) (chlorination of)				
IT	61551-75-5				
	RL: RCT (Reactant); RACT (Reactant or reagent) (esterification of, with thioglycolic acid)				
IT	<b>61551-71-1P</b>				
	RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent) (prepn. and hydrolysis of)				
IT	61551-70-0P				
	RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (prepn. and reaction with potassium ethyl xanthogenate)				
IT	61551-72-2P	61551-73-3P	61551-74-4P		
	RL: PREP (Preparation) (prepn. of)				
IT	35832-93-0				
	RL: RCT (Reactant); RACT (Reactant or reagent) (reaction of, with azobis(isobutyric acid)bis(chloroethyl)amide)				

IT 68-11-1, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with azobis(isobutyric acid)dipropionalamide)

IT 61551-71-1P  
 RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (prepn. and hydrolysis of)

RN 61551-71-1 HCAPLUS

CN Carbonodithioic acid, S,S'-[azobis[[ (2,2-dimethyl-1-oxo-2,1-ethanediyl)imino]-2,1-ethanediyl]] O,O'-diethyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 45 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1968:78731 HCAPLUS .

DN 68:78731

TI Synthesis and photochemical reactions of polymers containing dithiocarbamate and xanthate groups and their model compounds

AU Okawara, Makoto; Nakai, Takeshi

CS Tokyo Inst. Technol., Tokyo, Japan

SO Bulletin of the Tokyo Institute of Technology (1966), No. 78, 1-16  
 CODEN: BTITA5; ISSN: 0366-3736

DT Journal

LA English

CC 35 (Synthetic High **Polymers**)

GI For diagram(s), see printed CA Issue.

AB Uv irradiation of R(CH<sub>2</sub>)<sub>n</sub>S<sub>2</sub>CNR'<sup>2</sup> (I) and R(CH<sub>2</sub>)<sub>n</sub>S<sub>2</sub>COEt (II) produces free radicals via rupture of C-S<sub>2</sub>C or S-CS bonds. Scission occurs at S-CS in the following I (R, n, and R' given): Ph, 0 and 2, Et; CO<sub>2</sub>Et, 0 and 2, Et; p-XC<sub>6</sub>H<sub>4</sub>CO (X = Cl, Me, OMe, H), 0, Me. With I (R = Ph and CO<sub>2</sub>Et, n = 1, R' = Et), scission occurs at the C-S<sub>2</sub>C bond. Some scission of the C(O)-S bond is observed in the case of I (R = p-XC<sub>6</sub>H<sub>4</sub>CO, n = 0, R' = Me). The photodecomposition rate of the latter I derivs. increases in the order OMe < H < Me < Cl. Scission of the S-CS bond is observed also in the II derivs. (R = Ph. and CO<sub>2</sub>Et and n = 0, 1, and 2). Uv and ir spectral changes accompanying irradiation of II (R = Ph, n = 1) in soln. are shown. Radicals formed by photodecomposition of I or II accelerate the **polymn.** of methacrylate and styrene; the **polymn.** rate is proportional to the concn. of I or II and their photodecomposition rate consts. **Polymeric** I or II derivs. were made by heating the corresponding halogen deriv. with NaS<sub>2</sub>CNEt<sub>2</sub> or KS<sub>2</sub>COEt. Thus, 40 ml. of a soln. of 2 g. chloromethylated polystyrene and 1 g. NaS<sub>2</sub>CNEt<sub>2</sub> in HCONMe<sub>2</sub> was stirred 3 hrs. at 25.degree. and then poured into MeOH to ppt. 2.5 g. III. Polymers IV-IX were prepd. similarly. The normally inactive Cl in poly(vinyl chloride) was substituted readily by NaS<sub>2</sub>CNEt<sub>2</sub> to give X the structure of which was confirmed by ir and uv anal. The Cl in vinyl chloride-vinyl acetate copolymer and chlorinated paraffin reacted similarly but Cl in poly(vinylidene chloride) showed greatly reduced reactivity. XI, contg. N in the backbone **chain**, was prepd. by treating an aq. soln. of

poly(ethylenimine) with CS<sub>2</sub> and NaOH to give [-CH<sub>2</sub>N(CS<sub>2</sub>Na)CH<sub>2</sub>-], the ir spectrum of which was similar to that of the model compd. Me<sub>2</sub>NCS<sub>2</sub>Na. Heating a soln. of XII in HCONMe<sub>2</sub> with PhCH<sub>2</sub>Cl gave XI, contg. 8.83% N. H<sub>2</sub>C:CHS<sub>2</sub>CNR<sub>2</sub> (XIII) were made by heating a soln of ClCH<sub>2</sub>CH<sub>2</sub>Cl in HCONMe<sub>2</sub> with NaS<sub>2</sub>CNEt<sub>2</sub> to form (R<sub>2</sub>NCS<sub>2</sub>CH<sub>2</sub>)<sub>2</sub> (XIV) which decompd. at 220-70.degree. to XIII. The tabulated XIII and XIV were prepd. Monomer reactivity ratios for radical copolymn. of XIII (R = Et) with styrene at 60.degree. were r<sub>1</sub> = 0.14, r<sub>2</sub> = 4.1 with Alfrey-Price Q, e values of 0.45, -1.54. [TABLE OMITTED] The large Q value is characteristic compared to CH<sub>2</sub>:CHSCNEt<sub>2</sub> (Q = 0.34, e = -1.49) and CH<sub>2</sub>:CHO<sub>2</sub>CNEt<sub>2</sub> (Q = 0.02, e = -1.10). Photopolymn. of methyl methacrylate or styrene at 25.degree. in the presence of **polymeric** I or II leads to extensive grafting of monomer to polymer; formation of many short grafted chains and extensive crosslinking during grafting is indicative of the large **chain transfer** const. (4.8-10.7) of I or II derivs. **Polymeric** I or II derivs. form useful photo-resists, particularly in the presence of photosensitizer (benzoin methyl ether) and crosslinking agent (diethylene glycol dimethacrylate). Thermal stability of X is less than that of the parent poly(vinyl chloride), and ir anal. suggests that X decompn. occurs via a cyclic transition state (XV) with elimination of dithiocarbamic acid and an increase in polymer unsatn. Uv irradiation of X film increased its tensile strength to that of poly(vinyl chloride) because of the photo-crosslinking effect. Aq. solns. of XII formed colored ppts. (XVI) with metal ions as follows (M and color given): Cu<sup>2+</sup>, black-brown; (Ag<sup>+</sup>, Fe<sup>3+</sup>, Co<sup>2+</sup>, Ni<sup>2+</sup>), black; (Zn<sup>2+</sup>, Sn<sup>2+</sup>), yellow; (Hg<sup>2+</sup>, Al<sup>3+</sup>, Ce<sup>4+</sup>), brown. Similar chelates formed with metal ions and solns. of [-CH(S<sub>2</sub>CNHMe)CH<sub>2</sub>-] made by treating poly(vinyl chloride) with MeNHCSNa. Although benzyl mercaptan was obtained by LiAlH<sub>4</sub> redn. of I (R = Ph, n = 1, R' = Et), X could not similarly be reduced to a **polymeric** thiol. However, treatment of III with Et<sub>2</sub>NH in air gave the **polymeric** disulfide (XVII) derived from the **polymeric** thiol precursor.

ST DITHIOCARBAMATE POLYMERS; XANTHATE POLYMERS; PHOTOCHEMISTRY  
DITHIOCARBAMATE; POLYMERS

IT Polymerization catalysts

(dithiocarbamates and dithiocarbonates as, for polymn. of methyl methacrylate and styrene by light)

IT **Chain-transfer** agents

(dithiocarbamates and dithiocarbonates as, in **polymn.** of methyl methacrylate by light)

IT Q-e equation

(for styrenes, with vinyl diethyldithiocarbamate)

IT 30140-79-5P, preparation

RL: PREP (Preparation)

(Q-e values and reactivity ratios in)

IT 9011-14-7P, preparation

RL: PREP (Preparation)

(catalysts for, dithiocarbamates and dithiocarbonates as)

IT 9003-53-6P, preparation

RL: PREP (Preparation)

(catalysts for, dithiocarbamates as)

IT 9003-53-6, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(chloromethylated and dithiocarbamate and dithiocarbonate derivs., crosslinking of, by light)

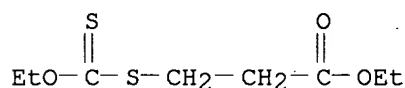
IT 2358-84-1

RL: RCT (Reactant); RACT (Reactant or reagent)

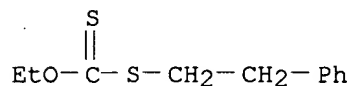
(crosslinking by, of styrene polymer dithiocarbonate derivs. in light)

IT 24968-99-8

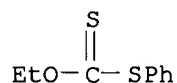
- RL: RCT (Reactant); RACT (Reactant or reagent)  
(crosslinking of, by light, in presence of oxydiethylene methacrylate)
- IT 9002-86-2, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(dithiocarbamate derivs., crosslinking of, by light)
- IT 9002-98-6  
RL: USES (Uses)  
(dithiocarbamate derivs., crosslinking of, by photolysis and methyl chelate formation)
- IT **3278-33-9 3278-36-2 3278-38-4** 14245-70-6  
14245-71-7  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(photolysis of)
- IT 816-20-6 3052-60-6 3052-61-7 3052-62-8 3052-64-0 3052-73-1  
RL: USES (Uses)  
(polymn. of methyl methacrylate and styrene in presence of, by light)
- IT **2943-26-2 3278-34-0 3278-35-1** 7022-09-5  
RL: USES (Uses)  
(polymn. of methyl methacrylate in presence of, by light)
- IT 2448-40-0P 14245-72-8P 15351-43-6P 15351-44-7P 15351-45-8P  
15351-46-9P 15351-61-8P 15501-53-8P 18293-20-4P 18293-26-0P  
18293-27-1P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of)
- IT 30140-79-5P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn. of, Q-e values and reactivity ratios in)
- IT **3278-33-9 3278-36-2 3278-38-4**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(photolysis of)
- RN 3278-33-9 HCAPLUS  
CN Carbonic acid, dithio-, O-ethyl ester, S-ester with ethyl  
3-mercaptopropionate (8CI) (CA INDEX NAME)



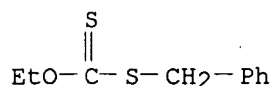
- RN 3278-36-2 HCAPLUS  
CN Carbonodithioic acid, O-ethyl S-(2-phenylethyl) ester (9CI) (CA INDEX NAME)



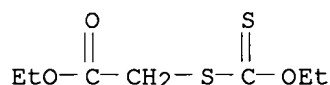
- RN 3278-38-4 HCAPLUS  
CN Carbonodithioic acid, O-ethyl S-phenyl ester (9CI) (CA INDEX NAME)



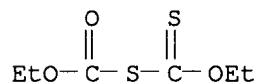
IT 2943-26-2 3278-34-0 3278-35-1 ( )  
 RL: USES (Uses)  
 (polymn. of methyl methacrylate in presence of, by light)  
 RN 2943-26-2 HCAPLUS  
 CN Carbonodithioic acid, O-ethyl S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



RN 3278-34-0 HCAPLUS  
 CN Acetic acid, [(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)



RN 3278-35-1 HCAPLUS  
 CN Thiodicarbonic acid ((HO)C(O)SC(S)(OH)), diethyl ester (9CI) (CA INDEX NAME)



L19 ANSWER 46 OF 46 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1965:455018 HCAPLUS

DN 63:55018

OREF 63:10070f-h

TI Syntheses and reactions of functional polymers. XX. Syntheses of photosensitive polymers containing xanthate groups and photochemical behavior of their model compounds

AU Okawara, Makoto; Nakai, Takeshi; Imoto, Eiji

CS Prefect. Univ., Osaka, Japan

SO Kogyo Kagaku Zasshi (1965), 68(3), 582-7

CODEN: KGKZA7; ISSN: 0368-5462

DT Journal

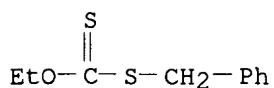
LA Japanese

CC 45 (Synthetic High **Polymers**)

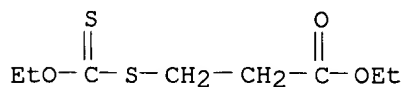
AB cf. CA 63, 3068g. Six model compds. having xanthate groups were synthesized and their photochem. properties were investigated. These compds. were PhSC(S)OEt (b0.2 103-6.degree., n22D 1.6100) (I), PhCH2SC(S)OEt (b9 154-6.degree., n25D 1.6051) (II), PhCH2CH2SC(S)OEt (b0.1 136-8.degree., n21D 1.5880) (III), EtO2CSC(S)OEt (b0.3 93-5.degree., n25D 1.5209) (IV), EtO2CCH2SC(S)OEt (b0.1 104-5.degree., n21D 1.5214) (V), and EtO2CCH2CH2SC(S)OEt (b0.1 107-9.degree. n25D 1.5178) (VI). They were decompd. in EtOH soln. by irradiation with uv light, and the rate was II > V > I > IV > III > VI and proportional to irradiation time. The presence

of COS bands in the ir spectra indicates that such radicals as RS.bul. and .bul.C(S)OR' are produced by photolysis of these compds. The accelerating effect of these compds. on the photo **polymerization** of styrene was  $I > II > V > III > IV > VI$ , and in the case of Me methacrylate (VII) was  $II > V > I > III > IV > VI$ . The rate of **polymerization** of styrene was proportional to the rate const. for the decompn. of these compds., but this relation did not apply in case of VII. Several polymers contg. SC(S)OEt groups in the matrix of polystyrene were synthesized and their properties were studied (CA 60, 14628e). These polymers were effectively photo-grafted with VII (grafting efficiency 72-93%) by **chain transfer**. Films of these polymers were photosensitive.

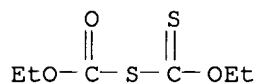
- IT Light  
(-sensitive materials, from Me methacrylate graft polymers with styrene polymers contg. xanthate groups)
- IT Light, ultraviolet  
(decompn. by, of ethylxanthic acid anhydrosulfides and ethylxanthic acid esters)
- IT Spectra, infrared  
(of ethylxanthic acid anhydrosulfide and ethylxanthic acid ester photolysis products)
- IT Polymerization  
(of methyl methacrylate and styrene, by ultraviolet light in presence of ethyl xanthic acid anhydrosulfides or esters)
- IT Acetic acid, mercapto-, ethyl ester, ethylxanthate
- IT Carbonic acid, thio-, O-ethyl ester, anhydrosulfide with ethylxanthic acid
- Xanthic acid, ethyl-, ester with Et 3-mercaptopropionate  
(methyl methacrylate or styrene polymerization by ultraviolet light in presence of, decompn. and)
- IT 2943-26-2, Xanthic acid, ethyl-, benzyl ester 3278-33-9,  
Propionic acid, 3-mercapto-, ethyl ester, ethylxanthate 3278-35-1  
, Xanthic acid, ethyl-, anhydrosulfide with O-Et thiocarbonate  
3278-36-2, Xanthic acid, ethyl-, phenethyl ester 3278-38-4  
, Xanthic acid, ethyl-, phenyl ester  
(methyl methacrylate or styrene polymerization by ultraviolet light in presence of, decompn. and)
- IT 80-62-6, Methyl methacrylate 100-42-5, Styrene  
(polymerization of, by ultraviolet light in presence of ethylxanthic acid anhydrosulfides or esters)
- IT 80-62-6, Methyl methacrylate  
(polymerization of, on styrene polymers contg. xanthate groups by light)
- IT 3278-34-0, Xanthic acid, ethyl-, ester with Et mercaptoacetate  
(prepn. of)
- IT 9003-53-6, Styrene polymers  
(xanthate group-contg., Me methacrylate graft polymerization on, by light)
- IT 2943-26-2, Xanthic acid, ethyl-, benzyl ester 3278-33-9,  
Propionic acid, 3-mercapto-, ethyl ester, ethylxanthate 3278-35-1  
, Xanthic acid, ethyl-, anhydrosulfide with O-Et thiocarbonate  
3278-36-2, Xanthic acid, ethyl-, phenethyl ester 3278-38-4  
, Xanthic acid, ethyl-, phenyl ester  
(methyl methacrylate or styrene polymerization by ultraviolet light in presence of, decompn. and)
- RN 2943-26-2 HCAPLUS
- CN Carbonodithioic acid, O-ethyl S-(phenylmethyl) ester (9CI) (CA INDEX NAME)



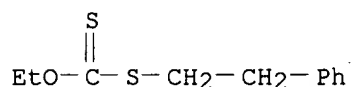
RN 3278-33-9 HCAPLUS  
 CN Carbonic acid, dithio-, O-ethyl ester, S-ester with ethyl  
 3-mercaptopropionate (8CI) (CA INDEX NAME)



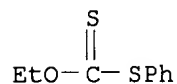
RN 3278-35-1 HCAPLUS  
 CN Thiodicarbonic acid ((HO)C(O)SC(S)(OH)), diethyl ester (9CI) (CA INDEX NAME)



RN 3278-36-2 HCAPLUS  
 CN Carbonodithioic acid, O-ethyl S-(2-phenylethyl) ester (9CI) (CA INDEX NAME)



RN 3278-38-4 HCAPLUS  
 CN Carbonodithioic acid, O-ethyl S-phenyl ester (9CI) (CA INDEX NAME)



IT **3278-34-0**, Xanthic acid, ethyl-, ester with Et mercaptoacetate  
 (prepn. of)  
 RN 3278-34-0 HCAPLUS  
 CN Acetic acid, [(ethoxythioxomethyl)thio]-, ethyl ester (9CI) (CA INDEX NAME)

